Are Low- or High-Effort Self-Control Strategies More Motivating?

by

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ABSTRACT

Consumers often must employ self-control strategies to resist temptations in order to achieve their self-control goals. Although prior work has identified many useful self-control strategies, it remains unclear when and how the anticipated amount of effort required to implement a specific strategy affects subsequent motivation to exercise self-control. In this dissertation, I aim to extend prior literature by examining when the anticipated amount of effort (low vs. high) required by a self-control strategy facilitates (vs. undermines) subsequent self-control. I hypothesize that the effect of anticipated effort to be expended in the use of a strategy on self-control is moderated by whether desirability or feasibility concerns are more salient. Across different self-control domains (saving money, maintaining physical health, being persistent, and overcoming procrastination), six experiments provide converging evidence that anticipated effort associated with using a self-control strategy has a direct *negative* effect on self-control under a feasibility focus, whereas it has an indirect *positive* effect on self-control under a desirability focus via an increase in the perceived importance of the associated self-control goal. Furthermore, results show that this effect is independent of the actual use of the strategy. The theoretical and practical implications of these findings are discussed.

Note: This dissertation has been written by Ding (Allen) Tian. Any reference to "we" anticipates joint submission to the target journal.

PREFACE

This thesis is an original work by Ding (Allen) Tian. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Imagination Skills and Product Preference," No. Pro00042097, September 03, 2013. My advisor Professor Gerald Häubl supervised the design of experiments and the collection of data.

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CHAPTER 1: INTRODUCTION

Individuals often have to engage in self-control in order to attain their virtuous goals (e.g., saving money, curbing impulse buying, quitting smoking, dieting, etc.) by overriding impulsive responses that are immediately gratifying yet deleterious in the long run. Despite the invaluable importance of self-control, people often find it difficult to implement and frequently suffer self-control failures in the face of temptations (Baumeister and Heatherton 1996; Baumeister, Heatherton, and Tice 1994; Baumeister, Vohs, and Tice 2007). Over the last few decades, self-control has received substantial attention from a range of disciplines, including economics, psychology, and marketing, and our understanding has been substantially advanced. Encouragingly, a number of cognitive and behavioral self-control strategies have been identified and communicated to the public in order to foster successful self-control (e.g., Andrade, Geoffrey, Melanson 2008; Ariely and Wertenbroch 2002; Hoch and Loewenstein 1991; Hung and Labroo 2011; Patrick and Hagtvedt 2012; Trope and Fishbach 2000; Wertenbroch 1998).

A critical dimension along which self-control strategies vary is the anticipated amount of effort required to implement them. Due to the difficult nature of exercising self-control, there is a tendency to provide low- rather than high-effort (objective or merely perceptual) strategies to individuals for the purpose of motivating and facilitating effective self-control. Recent research also suggests that the employment of simple, effortless self-control strategies is what distinguishes people high in self-control from those low in self-control (Gillebaart and de Ridder 2015). Although prior research has corroborated the effectiveness of many low- or high-effort self-control strategies when they are used, the motivational consequences of anticipated effort associated with them

remain poorly understood. Moreover, it is also unclear whether low-effort strategies are indeed more motivating than high-effort ones. This is an important and interesting question in that people nowadays have increasing access to various self-control strategies and the mere contemplation of low- or high-effort strategies (i.e., the anticipated amount of effort associated with using the strategies) may be sufficient to affect people's subsequent motivation to exert self-control, irrespective of their adoption.

Intuitively, low-effort self-control strategies should be more motivating than their high-effort counterparts. However, we argue that this is not necessarily the case. Building on cognitive energetics theory (Kruglanski et al. 2012) and prior work on effort, mental focus, and self-control, we propose that whether greater anticipated effort associated with using a strategy promotes or undermines subsequent self-control is contingent on whether individuals are focused on the desired outcomes and benefits the strategy can bring about (i.e., desirability focused) or on strategy processes and the relative ease of implementing them (i.e., feasibility focused). Specifically, we hypothesize that, under a feasibility focus, greater anticipated effort has a direct negative effect on subsequent motivation to exercise self-control; in contrast, under a desirability focus, greater anticipated effort has an indirect positive effect on subsequent motivation to exercise self-control by enhancing perceived goal importance. The results of six experiments across different self-control settings (i.e., saving money, maintaining physical health, being persistent, and overcoming procrastination) provide converging evidence in support of this theoretical framework.

The current research contributes to the existing literature in several ways. First, contributing to the self-control literature, this research forms the first attempt to address

how anticipated effort associated with using self-control strategies impacts subsequent motivation to exert self-control. We argue that the influence of a self-control strategy is not limited to its execution; mere contemplation of the strategy is sufficient to affect self-control. The results of six experiments provide converging evidence in support of this contention and show that whether low- or high-effort self-control strategies are more motivating is dependent on whether a desirability or feasibility mental focus is activated. We generalize this effect to a broad range of self-control goals and strategies. Second, our findings shed light on the process underlying this effect by showing that perceived goal importance mediates the positive effect of anticipated effort on self-control under a desirability focus, whereas anticipated effort exerts a direct negative impact on self-control under a feasibility focus. Moreover, this research extends prior literature on effort by showing that anticipated effort, traditionally considered to be a feasibility cue, also has implications for desirability.

Our results also contribute to cognitive energetics theory (Kruglanski et al. 2012) by showing that anticipated effort predicts both the driving and the restraining force. Specifically, anticipated effort strengthens the restraining force (i.e., task demand) when individuals are feasibility focused, whereas anticipated effort fuels the potential driving force by signaling goal importance when individuals are desirability focused. Our findings also contribute to the existing literature on motivation by showing that under certain circumstances, anticipated effort associated with an activity can have a positive effect on motivation even when individuals are not initially precommitted to the activity. Finally, this research contributes to the goal literature by demonstrating that the presence of a means of goal attainment (a low- or high-effort self-control strategy) does not

necessarily facilitate corresponding goal pursuit, and under some circumstances may ironically undermine goal-consistent behavior.

The remainder of this dissertation is organized as follows. We first review relevant literature and develop our predictions. Then, we describe six experiments designed to test our predictions across different self-control domains. We conclude with a discussion of the theoretical and practical implications of this research, as well as suggestions for future research.

CHAPTER 2: THEORETICAL FRAMEWORK

Theories of Self-Control

Self-control refers to "the capacity to override natural and automatic tendencies, desires, or behaviors; to pursue long-term goals, even at the expense of short-term attractions; and to follow socially prescribed norms and rules" (Bauer and Baumeister 2011, 65). In other words, self-control is the exercise of control over oneself in order to align thoughts and behavior with long-term desirable end states (Baumeister et al. 1998; Carver and Scheier 1998; Vohs and Baumeister 2004). Self-control can be conceptualized at both the trait level and the state level. A self-control dilemma arises when long-term goals conflict with short-term temptations (Dhar and Wertenbroch 2000; Fishbach, Friedman, and Kruglanski 2003; Fishbach and Trope 2005; Hoch and Loewenstein 1991; Loewenstein 1996; Thaler and Shefrin 1981). Indeed, "self-control dilemmas are fundamentally dual-motive conflicts" (Fujita 2011, 353).

Although the term "self-control" is often used interchangeably with "self-regulation" in prior literature, differences between the two should be noted. Self-regulation conceptually involves "modulation of thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms and supportive metaskills" (Karoly 1993, 25). That is, apart from reflective, conscious, and effortful regulatory processes, self-regulation also encompasses reflexive, nonconscious, and automatic regulatory processes (Baumeister et al. 2007; Fishbach et al. 2003; Fujita 2011; Gollwitzer 1999;

Hagger et al. 2010; Hagger and Chatzisarantis 2013; Papies and Aarts 2011). More importantly, self-regulation does not necessarily involve a conflict between long-term interests and short-term temptations (Fujita 2011). In contrast, self-control, which entails a dual-motive conflict and is the focus of the present research[1], is a subset of self-regulation in which deliberate and conscious control is exerted to alter one's attention, emotions, thoughts, impulses, or other automatic behavioral responses (Baumeister et al. 2007; Fujita 2011; Hagger, Wood, Stiff, and Chatzisarantis 2010; Hagger and Chatzisarantis 2013; Muraven and Baumeister 2000; Vohs 2006).

"Self-control is a hallmark virtue of human character" (Prelec and Bodner 2003, 277). It has been shown that high self-control is associated with physical, mental, and social well-being, including decreased frequency of overeating and alcohol abuse, increased exercise frequency, adaptive emotional responses, effective suppression of unwanted thoughts, academic and job success, high self-esteem, skillful perspective-taking ability, reduced aggression, and good interpersonal relationships (Baumeister et al. 1998; Baumeister et al. 1994; Duckworth and Seligman 2005; Finkel and Campbell 2001; Tangney, Baumeister, and Boone 2004; Crescioni et al. 2011; Mischel, Shoda, and Peake 1988). Conversely, deficits and failures of self-control are at the root of a number of personal and societal problems, such as impulse buying, credit card debt, unethical behavior, procrastination, ruminative thoughts, overeating and obesity, alcohol and drug abuse, crime and aggression, gambling, poor impression management, and inappropriate sexual responses (Baumeister 2002; Baumeister and Heatherton 1996; Baumeister et al. 1994; Bird, Hagstrom, and Wild 1999; Carver and Scheier 1996; DeWall, Baumeister, Stillman, and Gailliot 2007; Finkel et al. 2009; Gailliot and Baumeister 2007; Gino et al.

[1] In the present research, we use self-control and goal-directed behavior interchangeably.

2011; Gottfredson and Hirschi 1990; Martin and Tesser 1989; Mead et al. 2009; Tangney et al. 2004; Vohs, Baumeister, and Ciarocco 2005; Vohs et al. 2008; Vohs and Heatherton 2000; Vohs and Faber 2007).

Due to its substantial impact on individuals and society as a whole, self-control has been extensively researched across a variety of disciplines, including psychology, economics, and marketing. Many insightful self-control theories and models have been proposed and tested, including cybernetic models of self-regulation (Carver and Scheier 1981, 1982, 1998; Wang and Mukhopadhyay 2012), the theory of ironic processes of mental control (Wegner 1994), the hot/cool systems theory (Metcalfe and Mischel 1999), the limited strength model of self-control (Baumeister and Heatherton 1996; Baumeister et al. 1998; Baumeister, Vohs, and Tice 2007; Muraven and Baumeister 2000; Muraven, Tice, and Baumeister 1998), the reference-point model of desire (Hoch and Loewenstein 1991), the attentional myopia model of self-control (Mann and Ward 2007; Ward and Mann 2000), the self-signaling model of self-control (Dhar and Wertenbroch 2012; Prelec and Bodner 2003), justification-based models of self-control failure (De Witt Huberts, Evers, and De Ridder 2014; Khan and Dhar 2006, 2007; Kivetz and Simonson 2002; Kivetz and Zheng 2006; Mukhopadhyay and Johar 2009), counteractive self-control theory (Fishbach and Trope 2005; Fishbach, Zhang, and Trope 2010; Myrseth, Fishbach, Trope 2009; Trope and Fishbach 2000), the two-stage model of self-control (Myrseth and Fishbach 2009), the dynamics of self-regulation theory (Fishbach and Dhar 2005, 2008; Fishbach, Dhar, and Zhang 2006, Fishbach and Zhang 2008, 2009; Koo and Fishbach 2008; Zhang, Fishbach, and Dhar 2007), the passive goal guidance model (Laran and Janiszewski 2009), the reflective-impulsive model (Hofmann, Friese, and

Strack 2009; Strack, Werth, and Deutsch 2006), the resource-allocation model of self-control (Beedie and Lane 2012), the opportunity cost model (Kurzban, Duckworth, Kable, and Myers 2013), and the elaborated process model of self-control depletion (Inzlicht and Schmeichel 2012; Inzlicht, Schmeichel, and Macrae 2014), among others. Several more general theories also have been applied to self-control settings, such as construal level theory (e.g., Fujita, Trope, Liberman, and Levin-Sagi 2006; Trope and Liberman 2010) and regulatory focus theory (e.g., Dholakia, Gopinath, Bagozzi, and Nataraajan 2006; Higgins 1997). In many cases, these theories complement rather than compete with each other.

Among all of the above-mentioned self-control theories, the limited strength model of self-control (Baumeister and Heatherton 1996; Baumeister et al. 1998; Baumeister et al. 2007; Muraven and Baumeister 2000; Muraven et al. 1998) is widely considered to be the most influential in contemporary self-control research. This theory posits that people are equipped with a limited supply of self-regulatory resources which are taxed or depleted by the initial execution of self-control in a task, thereby impairing self-control in a subsequent task if the resources are not replenished. For example, refraining from eating a piece of enticing chocolate cake will render a health-conscious individual subsequently less able to stop an impulse purchase. In support of this theory, a large body of empirical research has demonstrated that acts of self-control rely on a common, limited pool of resources that can become depleted by successive attempts at self-control (e.g., Baumeister et al. 1998; DeWall et al. 2007; Finkel et al. 2009; Gino et al. 2011; Hagger et al. 2010; Hamilton, Vohs, Sellier, and Meyvis 2011; Mead et al. 2009; Muraven et al. 1998; Schmeichel, Vohs, and Baumeister 2003; Usta and Häubl 2011;

Vohs et al. 2008; Vohs and Heatherton 2000; Vohs and Faber 2007). Nevertheless, people's self-control resources are not necessarily static and can be improved over time through self-control exercise (Muraven, Baumeister, Tice, 1999; Oaten and Cheng, 2006ab, 2007; Sultan, Joireman, and Sprott, 2012).

However, the limited strength model is not without controversies and shortcomings. First, although the vast majority of prior studies observed effects consistent with predictions derived from the limited strength model, they did not provide any direct evidence on the underlying mechanism, and it is still unclear what exactly self-control resources are. More importantly, a burgeoning number of studies have identified various factors that can moderate the resource depletion effect (e.g., Agrawal and Wan 2009; Alberts, Martijn, and De Vries 2011; Clarkson, Hirt, Jia, and Alexander 2010; Choi and Fishbach 2011; Converse and DeShon 2009; Dewitte, Bruyneel, and Geyskens 2009; Friese and Wänke 2014; Hedgcock, Vohs, and Rao 2012; Job, Dweck, Walton 2010; Laran and Janiszewski 2011; Moller, Deci, and Ryan 2006; Muraven and Slessareva 2003; Rounding, Lee, Jacobson, and Ji 2012; Schmeichel and Vohs 2009; Thoman, Smith, and Silvia 2011; Trudel and Murray 2013; Wan and Sternthal 2008), but these findings cannot be easily explained within the framework of the limited strength model. In addition, many research findings on self-control successes or failures are beyond the scope of the limited strength model (e.g., Argo and White 2012; Fishbach and Dhar 2005; Kim 2013; Kivetz and Zheng 2006; Kurt, Inman, and Argo 2011; Laran 2010; Trudel, Murray, Kim, and Chen 2015; Wilcox, Block, and Eisenstein 2011; Wilcox, Kramer, and Sen 2011; Wilcox, Vallen, Block, and Fitzsimons 2009).

To address these issues, recent theorizing on self-control has emphasized the important role of motivation in self-control (e.g., Baumeister and Vohs 2007; Beedie and Lane 2012; De Witt Huberts et al. 2014; Fishbach and Dhar 2005; Inzlicht and Schmeichel 2012; Inzlicht et al. 2014; Vohs, Baumeister, and Schmeichel 2012) that has been long underappreciated, given that self-control inherently entails conflicting motivations. For instance, Inzlicht and colleagues recently proposed a process model of self-control depletion (Inzlicht and Schmeichel 2012; Inzlicht et al. 2014), arguing that self-control depletion phenomena are not due to the depletion of a limited pool of resources; rather, engaging in self-control leads to shifts in motivational orientation and attentional focus, which in turn give rise to poorer subsequent self-control performance. This process model provides an alternative account for self-control depletion and convincing explanations for the reason why a variety of factors can counteract the depletion effect.

Nevertheless, instead of being mutually exclusive, the limited resource account and the motivational account may jointly contribute to the self-control depletion effect. Baumeister and Vohs (2007) maintained that self-control depletion often reflects a temporary and partial (vs. a complete) exhaustion of resources, and motivation can counteract the depletion effect by inspiring depleted individuals to mobilize some of their remaining resources that would be otherwise conserved; however, motivation is no longer effective when individuals' mental resources are severely or thoroughly depleted. Recent empirical work has lent support for this conjecture (Muraven, Shmueli, and Burkley 2006; Vohs et al. 2012).

Recently, Kruglanski and colleagues proposed cognitive energetics theory (Kruglanski et al. 2012), which provides a promising and encouraging theoretical framework of self-control that incorporates both the limited resource account and the motivational account. Cognitive energetics theory posits that goal-directed behavior is determined by a dynamic process wherein a driving force matches or mismatches a restraining force. The potential driving force represents the maximal amount of energy or resources an individual is capable of investing in a given goal-pursuit activity. The restraining force represents a combination of independent sources of resistance to the goal-pursuit activity. Specifically, the magnitude of the potential driving force is determined by two principal factors: *perceived goal importance* (i.e., the magnitude of motivation to carry out the activity) and the pool of *available mental resources*. Notably, goal importance is assumed to determine the proportion of available resources that are recruited for the activity. In other words, the magnitude of the potential driving force is a function of the product of the momentarily available pool of mental resources and a fraction (ranging from zero to one) proportionate to goal importance. In contrast, the magnitude of the restraining force is an additive function of energy demands of the activity, the inclination toward resource conservation, and competing alternative goals salient at that moment. Finally, reducing or increasing the driving force is functionally equivalent to increasing or decreasing the restraining force. The potential driving force and the restraining force jointly determine effective driving force, which refers to the actual amount of resources invested in the goal-pursuit activity.

Reconciling the limited strength model and the motivation-based models, cognitive energetics theory argues that goal importance (motivation) and the available

resource pool are functionally interchangeable, such that an increase or decrease in one component can be offset by a proportionate decrease or increase in another component. For instance, depleted mental resources after an initial act of self-control can be offset by a proportionate increase in motivation. Furthermore, the multiplicative relationship between goal importance and the available resource pool indicates a boundary condition of this interchangeability. That is, motivation can no longer facilitate self-control via compensating for resource depletion if an individual's resources have been completely drained (i.e., are approaching zero) and vice versa. In the present research, we build our theoretical framework on cognitive energetics theory.

Self-Control Strategies

Self-control is inherently goal-directed. Individuals typically must employ self-control strategies or means to resist temptations in order to achieve their self-control goals (Ainslie 1975; Hoch and Loewenstein 1991; Rachlin 2000; Thaler and Shefrin 1981; Trope and Fishbach 2000; Wertenbroch 1998). In line with prior goal literature (Shah and Kruglanski 2003; Kopetz et al. 2012), a self-control strategy refers to an act (behavioral or cognitive) or object (be it a product offering, thing, situation, or person) that facilitates one's advancement toward a self-control goal. For example, a consumer may choose to pay for food with cash rather than by credit card (which is relatively painless and weakens impulse control) as a deterrent against purchasing unhealthy food products (Thomas, Desai, and Seenvasan 2011). In this case, the use of cash payments serves as a healthy eating strategy.

Past research has identified a wide variety of physical, cognitive, affective, social, situational, and environmental factors that provide insights into how to avoid self-control pitfalls or foster self-control successes. Self-control strategies can be either domain-independent or domain-specific. Domain-independent strategies are means that can be implemented across different self-control domains, such as precommitment (e.g., Ariely and Wertenbroch 2002; Hoch and Loewenstein 1991; Schwartz et al. 2014), self-distraction from temptations (Hoch and Loewenstein 1991; Mischel and Ebbesen 1970), self-imposed penalties (Ainslie 1975; Trope and Fishbach 2000), implementation intention (Gollwitzer and Brandstätter 1997; Gollwitzer and Sheeran 2009; Hedgcock et al. 2012; Webb and Sheeran 2003), high levels of construal (Fujita et al. 2006), lay beliefs (Job et al. 2010; Mukhopadhyay and Johar 2005), regulatory fit (Hong and Lee 2008), self-affirmation (Schmeichel and Vohs 2009), counteractive construal (e.g., Zhang, Huang, and Broniarczyk 2010), "fun" task construal (Laran and Janiszewski 2011), muscle tightening (Hung and Labroo 2011), selective information processing (Trudel and Murrary 2011), maintaining a consistent mindset (Hamilton et al. 2011), increasing perceived connectedness between current self and future self (Bartels and Rips 2010; Bartels and Urminsky 2011), self-talk (e.g., Kross et al. 2014; Patrick and Hagtvedt 2012), religious concepts (Rounding et al. 2012), mental representation of goal progress (Huang, Zhang, and Broniarczyk 2012), reduced online social network use (Wilcox and Stephen 2013), and environmental orderliness (Chae and Zhu 2014), among others. In contrast, domain-specific strategies are self-control devices that are employed for a specific self-control domain (e.g., saving money, dieting, exercising, etc.). For instance, a consumer who wants to curb impulse buying and save money can adopt strategies such as cost

bundling (Ainslie 1975; Hoch and Loewenstein 1991), economic cost assessment (Hoch and Loewenstein 1991; Rook and Hoch 1985), purchase quantity rationing (Wertenbroch 1998), mental budgeting (Krishnamurthy and Prokopec 2010), and the cyclical savings method (Tam and Dholakia 2014).

Because self-control involves effortful impulse inhibition, it is generally laborious and demanding (Baumeister et al. 1994; Baumeister et al. 2007; Herman and Polivy 2011; Mischel and Ayduk 2011; Muraven and Baumeister 2000). Since people often experience various consequential self-control failures despite their good intentions (Bauer and Baumeister 2011; Baumeister and Heatherton 1996; Baumeister et al. 1994), researchers, marketers, and policy makers have tended to provide and teach simple, low-effort self-control strategies (e.g., tightening one's muscles, "I don't" [vs. "I can't"] self-talk, or weight-loss teas for dieters) to help people attain self-control successes and long-term well-being. More often than not, these strategies communicated to individuals are either inherently less demanding or deliberately framed as being easy. The underlying assumption is that low-effort self-control tools can reduce the amount of effort of self-control exertion, thereby motivating and facilitating individuals to behave in line with their long-term goals. Indeed, recent research suggests that it is the employment of simple, effortless self-control strategies that distinguishes those who successfully exert self-control from those who are less successful (Gillebaart and de Ridder 2015). As a result, it is not uncommon for modern consumers to be exposed to messages from various information sources (both for-profit and not-for-profit), such as "A Simple Tip to Beat Impulse Buying," "An Easy Way to Lose Weight in 10 Days," and "Simple Approaches to Overcome Procrastination."

Although prior research has documented the effectiveness of a number of low- or high-effort self-control strategies among people who are required to implement them, it remains elusive how individuals initially react to strategies requiring low or high effort. In other words, it remains unclear how and why anticipated effort associated with a self-control strategy may motivate subsequent goal-directed behavior. We deem this an important question, in that consumers have increasing access to information about low- or high-effort self-control strategies from various sources (e.g., the Internet, journals, magazines, books, other people, etc.), and mere contemplation of these strategies may be sufficient to shape consumers' motivation and goal-directed behavior (irrespective of their actual use of these strategies). To this end, the present research forms the first attempt to investigate how anticipated effort in using a self-control strategy may affect subsequent self-control.

Prior research on goal pursuit provides support for our contention that mere contemplation of a self-control strategy is impactful enough to influence the pursuit of a corresponding goal served by the strategy. According to goal systems theory (Kruglanski et al. 2002), goals that are cognitively represented as knowledge structures are interconnected with their corresponding attainment means. It has been shown that the activation of a goal involves the activation of means or goal-related knowledge geared to its attainment (Aarts, Dijksterhuis, and De Vries 2001; Förster, Liberman, and Higgins 2005). More importantly, this spreading of activation is bidirectional. Shah and Kruglanski (2003) documented a novel "bottom-up" priming effect in which subliminally priming a means (e.g., the word "running") activates a corresponding goal (e.g., "fitness") and therefore facilitates effective goal pursuit, as long as the means is perceived to be

instrumental for attaining the goal. This line of research suggests that the presence of a self-control strategy may activate a corresponding self-control goal and goal-consistent behavior. For instance, exposure to a weight-loss program ad on a web page is likely to give rise to an act congruent with one's weight-loss goal.

However, exposure to means of goal attainment does not universally motivate goal-directed behavior; recent research has shown that under certain circumstances, such exposure may actually hamper goal-consistent behavior (e.g., Bolton, Cohen, and Bloom 2006; Etkin and Ratner 2012, 2013; Fishbach and Zhang 2008; Huang and Zhang 2013; Jiang and Lei 2014; Wilcox et al. 2009). For instance, Fishbach and Zhang (2008) showed that individuals are prone to self-control failure when goal attainment means (e.g., healthy foods) and temptations (e.g., unhealthy foods) are presented together in a unified choice set. Etkin and Ratner (2012) showed that perceived low (vs. high) variety among means (e.g., protein bars) undermines health-conscious consumers' motivation to pursue their fitness goals when perceived goal progress is low; in contrast, perceived high (vs. low) variety among means demotivates health-conscious consumers to pursue their fitness goals when perceived goal progress is high. In a related paper, these authors further demonstrated that a set of similar (vs. different) means decreases motivation to pursue a goal when individuals focus on short-term goal pursuit, whereas a set of different (vs. similar) means decreases motivation to pursue a goal when individuals focus on long-term goal pursuit (Etkin and Ratner 2013). Moreover, Huang and Zhang (2013) found that people are demotivated in the face of multiple (vs. a single) means when substantial progress has been made toward a goal, whereas the reverse is true when little progress has been made.

Although this stream of research has rendered novel insights into the motivational consequences of goal attainment means, scant attention has been paid to the impact of a specific characteristic (effort demand in particular) of a single attainment means on individuals' subsequent goal-directed behavior. In the current investigation, we aim to extend prior literature by examining when the anticipated amount of effort (low vs. high) required by a self-control strategy facilitates versus undermines subsequent self-control. We define *anticipated effort* as the expected amount of effort (psychological, physical, or perceptual) required to execute a self-control strategy. For instance, with respect to weight loss, anticipated effort associated with running (a high-effort strategy) is relatively high while anticipated effort associated with drinking weight-loss teas (a low-effort strategy) is relatively low.

Effort and Anticipated Effort of Using a Self-Control Strategy

Effort has long been considered negative and aversive in many disciplines (Eccles et al. 1983; Eisenberger 1992; Hull 1943; Kool, McGuire, and Rosen 2010; Simon 1955, 1990; Taylor 1981; Zipf 1949). According to Hull's (1943) law of less work, *ceteris paribus*, living organisms (either humans or animals) will choose actions that minimize effort. The principle of least effort indicates that effort is perceived as a cost for individuals (Zipf 1949). Similarly, the theory of bounded rationality suggests that individuals seek to reduce the effort associated with decision-making processes (Simon 1990). Decades of research from diverse fields has provided extensive empirical evidence that people prefer and rely on information that is easy to process or retrieve, purchase

products that are easy to use, favor decisions that are easy to make, employ heuristics that can simplify decision-making processes, make choices that are easy to justify, and engage in activities requiring the least effort (e.g., Adams, Nelson, and Todd 1992; Alter and Oppenheimer 2006; Bettman, Johnson, and Payne 1990; Bornstein 1989; Camerer and Hogarth 1999; Davis 1989; Dhar 1997; Garbarino and Edell 1997; Iyengar and Lepper 2000; Johnson and Payne 1985; Kool et al. 2010; Lee and Labroo 2004; Murray and Häubl 2011; Novemsky et al. 2007; Reber, Winkielman, and Schwarz 1998; Schwarz 2004; Schwarz et al. 1991; Sela, Berger, and Liu 2009; Shah and Oppenheimer 2008; Shugan 1980; Simonson 1989; Song and Schwarz 2008; Tversky and Kahneman 1973; Venkatesh, Morris, Davis, and Davis 2003; Wänke, Bohner, and Jurkowitsch 1997; White, Macdonnell, and Dahl 2011; Winkielman et al. 2003; Zajonc 1968). Importantly, these findings on effort avoidance are applicable not only to objective effort, but also to subjective processing effort (i.e., disfluency). For instance, in one study by Alter and Oppenheimer (2006), new stocks on the New York Stock Exchange (NYSE) with easy-to-pronounce names were preferred by investors and significantly outperformed stocks with difficult-to-pronounce names. Likewise, Song and Schwarz (2008) demonstrated that participants were more willing to prepare a Japanese roll if the recipe was printed in an easy-to-read font (Arial, 12 point) than if it was printed in a difficult-to-read font (Mistral, 12 point).

In line with these research findings, cognitive energetics theory (Kruglanski et al. 2012) posits that the anticipated effort demand of a given goal-pursuit activity constitutes a critical component of the restraining force opposed to the activity and the goal served by the activity. Thus, holding the potential driving force constant, a decrease (increase) in

the amount of effort required by a goal-pursuit activity is expected to decrease (increase) the restraining force, which in turn facilitates (undermines) the enactment of the activity and motivates (demotivates) actions consistent with the associated goal. Moreover, reducing the magnitude of the restraining force is functionally equivalent to increasing the magnitude of the driving force (Kruglanski et al. 2012). Therefore, put differently, the anticipation of lower effort demand of a goal-pursuit activity may enable an individual to more readily mobilize mental resources (i.e., potential driving force) to pursue the goal. In sum, this line of reasoning and the aforementioned research findings on effort suggest that, when contemplating a self-control strategy, individuals will become more motivated to exert self-control when anticipated effort associated with the strategy is low than when it is high.

Despite this effort aversion, effort does not always have negative connotations. First, expending effort on an activity tends to boost the value of the activity (Lewis 1965). Both cognitive dissonance theory and self-perception theory indicate that an increase in expended effort (e.g., money, time, or physical exertion) results in more favorable outcome evaluations (Aronson and Mills 1959; Bem 1972; Festinger 1957). Recent empirical studies in diverse contexts have lent further credence to this value-enhancing effect of effort investment (Brown and Peterson 1994; Cho and Schwarz 2008; Ge, Brigden, and Häubl 2015; Kruger, Wirtz, Van Boven, and Altermatt 2004; Moreau, Bonney, and Herd 2011; Morales 2005; Norton, Mochon, and Ariely 2012). For example, consumers value self-assembled products (e.g., IKEA, Lego) more than objectively similar products that are not self-assembled (Norton et al. 2012). People also use effort

invested as a heuristic to infer quality when evaluating an object (e.g., a painting) made by another person (Kruger et al. 2004).

Second, this positive association between effort and value is bidirectional in nature. That is, people are inclined to conserve effort unless an activity they are performing is of great value. Individuals can become motivated to exert rather than save effort (Bosmans, Pieters, and Baumgartner 2010; Brehm and Self 1989; Eisenberger 1992; Higgins 1997; Gollwitzer and Brandstätter 1997; Glucklich 2001; Locke et al. 1981; Sosis 2004, 2006), even if this unnecessarily complicates decisions (Schrift, Netzer, and Kivetz 2011; Sela and Berger 2012). For instance, the theory of motivation intensity indicates that an individual will invest effort in a task that is proportionate to the demands of the task, conditional on sufficient goal commitment (Brehm and Self 1989). Moreover, Schrift and colleagues (2011) demonstrated that when an important decision feels easier to resolve than was anticipated, consumers will increase their effort (e.g., by overweighing small disadvantages of dominant alternatives, distorting information retrieved from memory, and reversing the ordinal value of attributes) and needlessly complicate the decision because they feel a need to match the effort actually expended to the anticipated decision effort.

Furthermore, the positive relationship between effort and value can even apply to anticipated and processing effort (i.e., subjective feelings of effort). An emerging line of research has shown that, under certain circumstances, individuals prefer more effortful options (Cutright and Samper 2014; Galak and Nelson 2011; Gibbs and Drolet 2003; Kivetz and Simonson 2003; Labroo and Kim 2009; Labroo, Lambotte, and Zhang 2009; Olivola and Shafir 2013; Pocheptsova, Labroo, and Dhar 2010; Thompson and Ince

2013), and devalue options that are easy to process (Labroo, Lambotte, and Zhang 2009). More importantly, anticipated or subjective feelings of effort can boost motivation[2] or perceived goal value. Sela and Berger (2012) showed that experiencing unexpected difficulty when making objectively trivial decisions increases the perceived importance of the decisions and therefore motivates consumers to invest needless effort (e.g., spend more time, seek more options), which ironically increases the decision difficulty and leads to so-called "decision quicksand." This also applies to contexts in which self-control is required. In a series of studies, Olivola and Shafir (2013) showed that anticipated effort and pain associated with a charitable cause increases people's willingness to donate more money to the cause due to enhanced perceptions of the meaningfulness (i.e., value and importance) of their contributions. Similarly, in one study by Labroo and Kim (2009), participants primed with the goal of becoming a kinder person donated more money when charity materials were difficult (vs. easy) to process. Trope and Fishbach (2000) demonstrated that anticipated discomfort and pain associated with a goal-directed activity (e.g., a medical test) triggers counteractive control processes that boost the value of the activity and hence maintain the motivation to engage in the activity (see also Fishbach and Trope 2005). These research findings are consistent with conventional wisdom that people associate important (goal-directed) activities with effort and difficulty. In other words, people hold lay beliefs that attaining valuable and important goals (e.g., publishing in top-tier journals) often requires more effort than achieving trivial and unimportant ones (e.g., purchasing basement window curtains), and

[2] Motivation is often measured in terms of physical or psychological effort (Touré- Tillery and Fishbach 2014). However, motivation and effort are conceptually distinct constructs. Motivation represents a psychological state, drive, or predisposition of an individual that encompasses direction, intensity, and persistence of behavior, whereas effort represents the force or energy by which activities or behaviors are enacted (e.g., Ford 1992; Ilgen and Klein 1988; Naylor, Pritchard, and Ilgen 1980).

that greater effort invested is usually accompanied by greater rewards (i.e., no pain, no gain). In fact, such beliefs can be so strong that people still expect rewards in return even when the rewards are determined without regard to the effort expended (Reczek, Haws, and Summers 2014), and that the mere perception of another person's effortful behavior renders the goal implied by the behavior readily accessible (Dik and Aarts 2007, 2008).

In the same vein, greater anticipated effort associated with using a self-control strategy may enhance the incentive value of the relevant goal, which in turn intensifies the motivation to exercise self-control. According to cognitive energetics theory (Kruglanski et al. 2012), perceived goal importance is an antecedent of the driving force. Holding the restraining force constant, an increase (decrease) in the amount of effort required by a goal-pursuit activity may increase (decrease) the goal importance and therefore the potential driving force, which in turn motivates (demotivates) actions congruent with the associated goal. Thus, it is likely that, when contemplating a self-control strategy, individuals will become more motivated to exert willpower in a subsequent self-control conflict when the anticipated effort associated with the strategy is high than when it is low. For example, when a person contemplates doing planks to achieve physical fitness, he or she may think, "Doing planks is pretty effortful, so physical fitness must be very valuable and important." According to cognitive energetics theory, this person would then be motivated to enact behavior consistent with this goal (irrespective of actual use of the plank strategy).

In summary, although it is plausible to predict that a low-effort self-control strategy is more motivating than a high-effort strategy, it is equally plausible to expect exactly the opposite; that is, a high-effort self-control strategy is more motivating than a

low-effort one by boosting perceived value and importance of the associated self-control goal. Supporting both contentions, recent research has shown that the interpretation of effort information is not static, but malleable (Buechel and Janiszewski 2014; Briñol, Petty, and Tormala 2006; Kim and Labroo 2011; Labroo and Kim 2009; Nielsen and Escalas 2010; Park and Bae 2014; Tsai and McGill 2011). Thus, this raises the question of when low- or high-effort self-control strategies are more motivating. Building on cognitive energetics theory and prior literature on effort, mental focus, and self-control, we posit that both low- and high-effort self-control strategies can be more motivating depending on whether (anticipated) effort serves as a determinant of the restraining force (i.e., task demand) or the driving force (i.e., an indicator of goal importance). To be specific, we propose that whether a low- or high-effort self-control strategy is more motivating and thereby facilitates subsequent self-control is contingent on individuals' mental focus (i.e., relative emphasis on desirability or feasibility). We predict that a *low-effort* self-control strategy is more motivating under a *feasibility* focus, whereas a *high-effort* self-control strategy is more motivating under a *desirability* focus. We illustrate our reasoning in the next section.

The Moderating Role of Desirability versus Feasibility Focus

Desirability and feasibility focus can be differentiated when considering a goal-directed action (Trope, Liberman, and Wakslak 2007). According to prior research (Liberman and Trope 1998; Vallacher and Wegner 1987, 1989), desirability refers to the value or attractiveness of an action's end state, reflecting *why* aspects of an action (i.e., the rewards of the action that motivate action enactment), whereas feasibility refers to the

ease or difficulty of reaching the end state, reflecting *how* aspects of an action (i.e., the process or steps of carrying out the action). When considering an action, individuals may focus primarily on either desirability or feasibility. For example, when it comes to purchasing a coffee, desirability-focused individuals will attend to the benefits of drinking coffee (e.g., increased productivity at work), whereas feasibility-focused individuals will attend to the processes related to purchasing a coffee (e.g., the convenience of grabbing a coffee from a coffee shop before a meeting). It is well documented that desirability/feasibility focus shapes people's judgment, decisions, and behavior (e.g., Cohen, Belyavsky, and Silk 2008; Goodman and Malkoc 2012; Hamilton and Thompson 2007; Irmak, Wakslak, and Trope 2013; Liberman and Trope 1998; Liviatan, Trope, and Liberman 2008; Liu 2008; Todorov, Goren, and Trope 2007).

We predict that a low-effort self-control strategy fuels the motivation to exert self-control more than a high-effort strategy when individuals are feasibility-focused. Under a feasibility focus, people place emphasis on the difficulty and processes of implementing a self-control strategy. The amount of effort people must put forth to use the strategy constitutes its energy demand, which contributes to the restraining force opposing goal-directed behavior (Kruglanski et al. 2012). In this case, a less laborious strategy signals the smoothness and ease of the process of goal pursuit, and a lower level of anticipated effort decreases the restraining force. As a result, individuals may become more motivated to mobilize mental resources and exhibit greater self-control. Conversely, a higher-effort strategy suggests obstacles and difficulty during goal pursuit, and a higher level of anticipated effort increases the restraining force. As a result, individuals' subsequent motivation to exert self-control will be undermined. For example, feasibility-

focused dieters may become more motivated to engage in self-control when they read about a weight-loss tea than when they read about a laborious plank exercise.

In contrast, we predict that a high-effort self-control strategy fosters the motivation to exert self-control more than a low-effort strategy when individuals are desirability-focused. Under a desirability focus, people emphasize the value and benefits associated with using a self-control strategy. The amount of effort people must put forth to use the strategy serves as an indicator of goal value or importance, which contributes to the potential driving force that facilitates goal-directed behavior (Kruglanski et al. 2012). In this case, a less laborious strategy decreases perceived importance of a self-control goal, and a lower level of anticipated effort reduces the potential driving force. As a result, individuals may feel demotivated to exert self-control. Conversely, a higher-effort strategy enhances perceived goal value, and a higher level of anticipated effort boosts the potential driving force. As a result, greater perceived goal importance fosters subsequent motivation to exert self-control. For example, desirability-focused dieters may become more motivated to engage in self-control when they read about a demanding plank exercise than when they read about a weight-loss tea.

To summarize, we postulate that whether a low- or high-effort self-control strategy is more motivating depends on which mental focus (desirability vs. feasibility) is activated when contemplating the strategy (see fig. 1). Specifically, we hypothesize the following:

H1: Mental focus (desirability vs. feasibility) while contemplating a self-control strategy moderates the effect of the anticipated effort associated with the strategy on subsequent motivation to exert self-control.

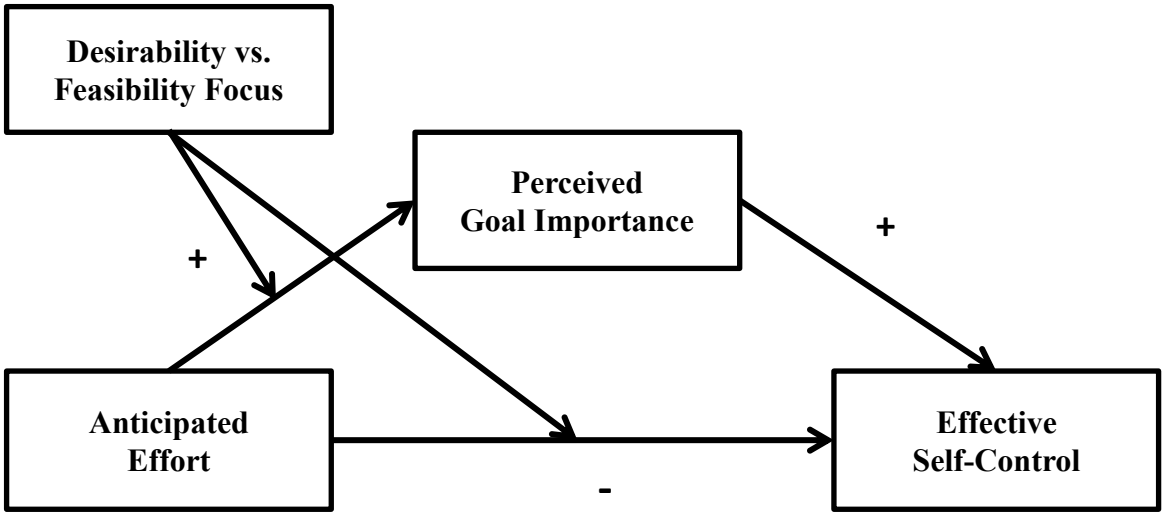
H1a: Under a feasibility focus, anticipated effort has a negative effect on self-control.

H1b: Under a desirability focus, anticipated effort has a positive effect on self-control.

H2: Perceived goal importance mediates the effect of anticipated effort on self-control under a desirability focus, but not under a feasibility focus.

FIGURE 1

CONCEPTUAL FRAMEWORK



We conducted six experiments to test our hypotheses (see table 1). To examine the robustness of the effects, we tested our predictions across different self-control contexts using different self-control strategies: saving money (Experiment 1a), achieving physical fitness (Experiment 1b), being persistent (Experiment 2 and 5), maintaining physical health (Experiment 3), and overcoming procrastination (Experiment 4). Specifically, experiment 1a and 1b provided initial evidence for the proposed interactive

effect of anticipated effort and desirability versus feasibility focus on subsequent motivation to exert self-control. By manipulating anticipated effort via processing fluency, experiment 2 extended the interaction effect to a behavioral measure of self-control in a context where people had a chance to use a given self-control strategy. In experiment 3 and 4, we investigated the psychological mechanism underlying this effect. Finally, experiment 5 demonstrated this effect in a context in which people would naturally focus on desirability or feasibility by varying perceived stages of goal pursuit (initial stage vs. advanced stage). Across these experiments, we demonstrated that people's focus on feasibility or desirability could be elicited in different ways (directly or indirectly, incidentally or not incidentally), which in turn shapes the way anticipated effort affected subsequent motivation to exercise self-control.

TABLE 1

SUMMARY OF EXPERIMENTS

Experiment	Anticipated Effort (Low vs. High)	Mental Focus (Feasibility vs. Desirability)	Self-Control Domain (Hypothesis to be Tested)
1a	Direct effort information	Feasibility vs. desirability focus	Saving money (H1a, H1b)
1b	Direct effort information	Feasibility vs. desirability focus	Physical fitness (H1a, H1b)
2	Easy- vs. hard-to-read font	Feasibility vs. desirability focus	Task persistence (H1a, H1b)
3	Direct effort information	Process vs. outcome simulation	Physical health (H1a, H1b, H2)
4	Direct effort information	Low vs. high construal level	Procrastination (H1a, H1b, H2)
5	Direct effort information	Initial vs. advanced goal pursuit stage	Task persistence (H1a, H1b)

CHAPTER 3: EXPERIMENT 1A

The objective of experiment 1a was to determine whether the effect of anticipated effort associated with using a self-control strategy on subsequent self-control is moderated by a desirability (vs. feasibility) focus (H1a and H1b). To do so, we directly manipulated anticipated effort and mental focus. In this experiment, participants read about a strategy for avoiding impulse buying and saving more money. Impulse buying and not saving enough money are pervasive and consequential self-control problems (Baumeister 2002; Tam and Dholakia 2014; Vohs and Faber 2007). It has been shown that 75% of Americans have made impulse purchases (CreditCards.com 2014), and approximately 62% of supermarket sales and 80% of luxury good sales in the United States are impulse purchases (Abrahams 1997; Agins 2004). In addition, only 38% of eligible employees participate in employers' automatic-payroll-deduction plans that serve to increase savings (Helman, Copeland, and VanDerhei 2012; Thaler and Benartzi 2004).

Method

We recruited 281 individuals (41% female, gender information was missing for one individual) from across the United States via Amazon Mechanical Turk (MTurk). Participants were compensated with a small amount of money. The experiment employed a 2 (anticipated effort: low vs. high) x 2 (mental focus: feasibility vs. desirability) between-subjects design. Participants were randomly assigned to one of the four

conditions. All participants were asked to read about a strategy for saving more money (the "take a step back" strategy, see Appendix A). Immediately prior to the reading task, participants in the feasibility focus conditions were told, "When you review the strategy on the next screen, please focus entirely on convenience and easiness of using the strategy;" whereas participants in the desirability focus conditions were told, "When you review the strategy on the next screen, please focus entirely on desired outcomes and benefits the strategy can bring about." Anticipated effort was manipulated within the description of the strategy. Specifically, participants in high (low) effort conditions read: "Research indicates that this strategy is rather effortful (almost effortless). According to a recent large-scale survey, 83% of consumers who followed this strategy when shopping reported that it requires a substantial amount of effort (it does not require much effort at all)." After reading about the strategy, participants responded to a series of items including manipulation check items. Specifically, participants were asked to indicate the amount of effort required to use the strategy (0 = none, 10 = a lot), and the extent to which they focused on feasibility versus desirability when reading about the strategy (0 = convenience and easiness, 10 = outcomes and benefits). Participants also reported whether they had known about this strategy prior to this study (0 = no, 1 = yes), general affect (0 = bad, 10 = good), impulse buying frequency (0 = never, 10 = frequently), perceived task difficulty (0 = not difficult at all, 10 = very difficult), task involvement (0 = not involved at all, 10 = very involved), and task enjoyment (0 = not at all, 10 = very much). Next, participants proceeded to an ostensibly unrelated study. They made a series of consumer decisions in which our dependent measure was embedded. To be specific, participants were asked to imagine that they received an income tax rebate of $500 and to

indicate how much out of the $500 they would put into their personal savings. Finally, participants provided demographic information including income level.

Results and Discussion

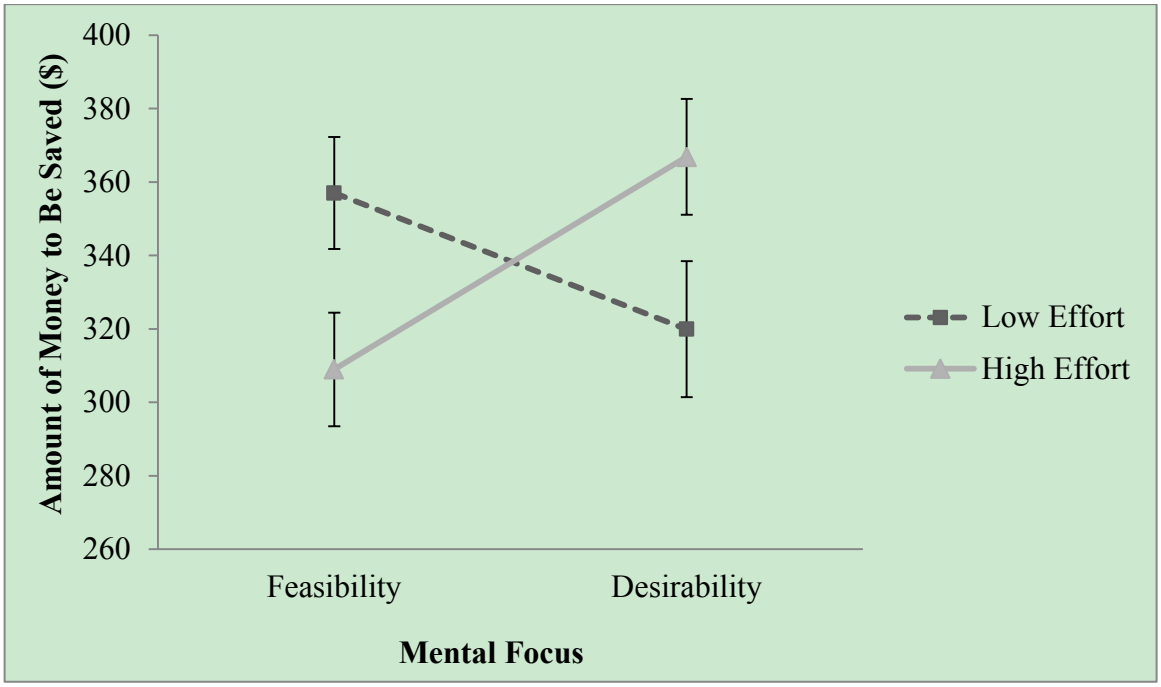
Manipulation Checks. A 2 (anticipated effort) x 2 (mental focus) ANOVA on anticipated effort associated with using the strategy revealed only a main effect of anticipated effort ($F(1, 277) = 320.99$, $p < .001$). As expected, participants in the low effort conditions perceived the "take a step back" strategy to be less effortful ($M_{low} = 2.01$) than those in the high effort conditions ($M_{high} = 7.27$). Moreover, a 2 x 2 ANOVA on self-reported mental focus revealed only a main effect of mental focus ($F(1, 277) = 74.93$, $p < .001$). As expected, participants in the desirability focus conditions focused more on outcomes and benefits associated with using the strategy ($M_{desirability} = 7.37$) while participants in the feasibility focus conditions focused more on convenience and easiness of using the strategy ($M_{feasibility} = 4.09$).

Self-Control. The self-control measure in this experiment was operationalized in terms of the amount of money participants reported they would save out of the income tax rebate of $500. A 2 (anticipated effort) x 2 (mental focus) ANOVA on this measure of self-control revealed only a significant hypothesized interaction between anticipated effort and mental focus ($F(1, 277) = 8.43$, $p = .004$; see fig. 2). Planned comparisons showed that greater anticipated effort reduced the amount of money participants who were focused on feasibility indicated they would save ($M_{low} = \$357.00$ vs. $M_{high} = \$308.96$; $t(277) = 2.05$, $p = .02$, one-tailed), reflecting lower self-control. Conversely,

greater anticipated effort increased the amount of money participants who were focused on desirability indicated they would save (M_{low} = $319.93 vs. M_{high} = $366.87; $t(277)$ = -2.06, p = .02, one-tailed), reflecting greater self-control.

FIGURE 2

EXPERIMENT 1A: MONEY SAVING INTENTION AS A FUNCTION OF ANTICIPATED EFFORT AND MENTAL FOCUS



NOTE.—Error bars denote standard errors.

Additional Analyses. The significant interaction between anticipated effort and mental focus on self-control persisted ($F(1, 271) = 9.78$, p = .002) after controlling for participants' impulse buying frequency (p = .001), income level (p = .017), and strategy familiarity (p = .60). We also performed 2 x 2 ANOVAs on perceived task difficulty, task involvement, task enjoyment, and general affect. We did not find any significant effects

except for a main effect of anticipated effort on general affect, such that greater anticipated effort dampened affect (M_{low} = 7.99 vs. M_{high} = 7.37; $F(1, 277) = 6.93$, p = .009). Thus, perceived task difficulty, task involvement, task enjoyment, and general affect were unlikely to account for the interaction effect between anticipated effort and mental focus on self-control.

Discussion. The results from this experiment provided initial support for our hypotheses, such that feasibility-focused individuals exhibited greater self-control after reading about a low-effort (vs. high-effort) self-control strategy (H1a), whereas desirability-focused individuals exerted greater self-control after reading about a high-effort (vs. low-effort) self-control strategy (H1b). We also found that general affect, perceived task difficulty, task involvement, and task enjoyment could not explain this effect.

CHAPTER 4: EXPERIMENT 1B

The purpose of experiment 1b was to demonstrate the predicted effect (H1a and H1b) by employing a product as a self-control strategy. In this experiment, participants were exposed to a product ad (Nike Free Trainer Shoe) designed to facilitate physical fitness.

Method

We recruited 122 individuals (45% female, gender information was missing for three individuals) from across the United States via Amazon Mechanical Turk. These participants passed an attention trap prior to the main experiment and were compensated with a small amount of money in exchange for their participation. The experiment employed a 2 (anticipated effort: low vs. high) x 2 (mental focus: feasibility vs. desirability) between-subjects design. Participants were randomly assigned to one of the four conditions. Prior to reviewing a Nike print ad (see Appendix B), participants were instructed to focus on either obstacles and temptations that may be encountered while using the product (feasibility focus), or desired outcomes and benefits that using the product might bring about (desirability focus). Anticipated effort was manipulated within the ad (adapted from Cutright and Samper 2014). Specifically, in low effort conditions, the ad emphasized that this Nike training shoe was designed to help people get fit with limited effort, whereas in high effort conditions the ad emphasized that the training shoe

was designed to help people get fit when accompanied by diligent effort. After reviewing the ad, participants responded to a series of items in which our focal dependent measure was embedded (i.e. "How many times do you expect to exercise next week?"). To check our manipulations, participants were asked to indicate how much effort they would need to expend to get fit by using the shoe (0 = none, 10 = a lot), and the extent to which they focused on feasibility versus desirability when contemplating wearing the shoes (0 = obstacles and temptations, 10 = outcomes and benefits). Participants also reported the extent to which they liked the advertised shoe (0 = not at all, 10 = very much), their likelihood of purchasing the shoe (0 = not likely at all, 10 = very likely), the extent to which they felt they had control over exercise outcomes (0 = little, 10 = a lot), whether or not they had previously purchased the shoe (0 = no, 1 = yes), general affect (0 = bad, 10 = good), task involvement (0 = not involved at all, 10 = very involved), and task enjoyment (0 = not at all, 10 = very much). Finally, participants provided demographic information.

We excluded seven participants from the analysis because they did not read about the self-control strategy. Four repetitive observations (based on IP address) were also removed from analysis. Thus, we analyzed data from a final pool of 111 participants.

Results and Discussion

Manipulation Checks. A 2 (anticipated effort) x 2 (mental focus) ANOVA on the anticipated effort check measure revealed only a main effect of anticipated effort ($F(1, 107) = 100.68$, $p < .001$). As expected, participants in the high effort conditions reported that they had to expend more effort to get fit by wearing the Nike shoes ($M_{high} = 8.74$)

than did those in the low effort conditions (M_{low} = 4.22). Moreover, a 2 x 2 ANOVA on self-reported mental focus revealed only a main effect of mental focus (F(1, 107) = 93.20, p < .001). As expected, participants in the desirability focus conditions focused more on outcomes and benefits ($M_{desirability}$ = 7.98) while participants in the feasibility focus conditions focused more on obstacles and temptations ($M_{feasibility}$ = 2.86).

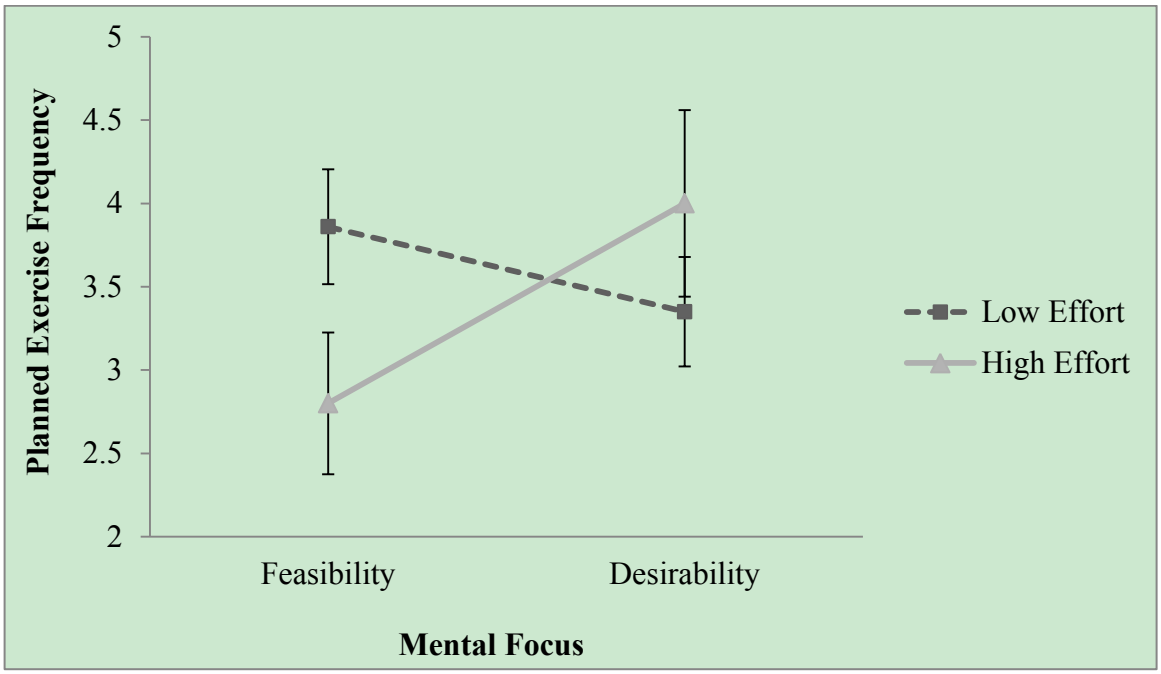
Self-Control. The self-control measure in this experiment was participants' planned exercise frequency for the following week. A 2 (anticipated effort) x 2 (mental focus) ANOVA on this dependent measure revealed only a significant interaction between anticipated effort and mental focus (F(1, 107) = 4.04, p = .047; see fig. 3). Planned contrasts showed that feasibility-focused participants intended to exercise more frequently when anticipated effort associated with the shoe was lower (M_{low} = 3.86 vs. M_{high} = 2.80; t(107) = 1.80, p = .037, one-tailed). However, contrary to our expectations, desirability-focused participants did not report significantly higher planned exercise frequency when anticipated effort associated with the shoe was greater (M_{low} = 3.35 vs. M_{high} = 4.00; t(107) = -1.06, p = .14, one-tailed).

Additional Analyses. This interactive effect remained significant (F(1, 106) = 3.94, p = .05) after controlling for whether or not participants had previously purchased the Nike shoes (p = .15). We also performed 2 x 2 ANOVAs on product attitude, purchase intention, perceived control, task involvement, task enjoyment, and general affect. We did not find any significant effects except for a main effect of anticipated effort on task enjoyment, such that participants enjoyed the task more when anticipated effort was low than when it was high (M_{low} = 8.07 vs. M_{high} = 7.16; F(1, 107) = 4.79, p = .031), and a marginal main effect of anticipated effort on purchase intention, such that participants

were more willing to purchase the shoes when anticipated effort was low (M_{low} = 5.63 vs. M_{high} = 4.46; $F(1, 107) = 3.62$, $p = .060$). Thus, product attitude, purchase intention, perceived control, task involvement, task enjoyment, and general affect were ruled out as possible explanations for this effect.

FIGURE 3

EXPERIMENT 1B: PLANNED EXERCISE FREQUENCY AS A FUNCTION OF ANTICIPATED EFFORT AND MENTAL FOCUS



NOTE.—Error bars denote standard errors.

Discussion. In this experiment, we tested H1a and H1b in a new self-control setting. We used a physical product (the Nike shoe) as a strategy for achieving physical fitness. Results revealed that feasibility-focused individuals were motivated to exercise more frequently when the Nike shoes were framed as requiring low (vs. high) effort,

supporting H1a. However, among desirability-focused individuals, no differences in planned exercise frequency arose whether the Nike shoes were framed as requiring high or low effort (although means were in the predicted direction), failing to support H1b. This statistical insignificance may be due to small sample size.

It should be noted that the self-control measures in experiments 1a and 1b were intentional. It remains unaddressed whether the effect can extend to behavioral measures. In addition, these two experiments did not afford participants an opportunity to actually use the focal self-control strategy in the face of the subsequent self-control conflict. Thus, it is unclear whether the predicted interactive effect would hold if participants had the opportunity to instantly implement the strategy in the face of a self-control conflict. In experiment 2, we aimed to address these issues.

CHAPTER 5: EXPERIMENT 2

The purpose of experiment 2 was to test our hypotheses (H1a and H1b) with a behavioral measure of self-control (task persistence) and to examine the robustness of our proposition in a self-control context where people had an opportunity to implement the strategy. Task persistence has been widely utilized as a standard measure of self-control (Fujita et al. 2006; Hong and Lee 2008; Hung and Labroo 2011; Muraven et al. 1998; Trudel and Murray 2013). To further enhance the generality and practicality of the findings, we adopted a different anticipated effort manipulation in this experiment. Previous research has shown that consumer judgments and decisions rely not only on declarative information (i.e., information presented to consumers), but also on experiential information (i.e., metacognitive experiences when processing declarative information; Schwarz 2004). A number of empirical studies have demonstrated that subjective processing ease (fluency) or difficulty (disfluency) shapes people's judgments and decisions, even though it is inherently noninstrumental and nondiagnostic (e.g., Kim and Labroo 2011; Labroo and Kim 2009; Novemsky et al. 2007; Reber et al. 1998; Song and Schwarz 2008; Tsai and McGill 2011). This is because individuals tend to use the difficulty or ease with which they process information as a useful input for judgments (Schwarz 2004) and this subjective processing effort is attributed to the decision being made (Briñol et al. 2006) as long as the informational value of the metacognitive experience is not called into question (Schwarz 2004). Thus, the predicted effect might

also arise when the anticipated amount of effort associated with a self-control strategy is elicited by subjective processing effort.

Method

We recruited 120 individuals (51% female, gender information was missing for two individuals) from across the United States via Amazon Mechanical Turk. Participants passed an attention trap prior to the main experiment and were compensated with a small amount of money in exchange for their participation. This experiment employed a 2 (processing effort: easy-to-read font [low effort] vs. difficult-to-read font [high effort]) x 2 (mental focus: feasibility vs. desirability) between-subjects design. We randomly assigned participants to one of the four conditions. All participants were told that they were going to complete three ostensibly unrelated tasks.

The first task was to read about a strategy for becoming more persistent (the "muscle-firming" strategy, see Appendix C), which has been shown to be an effective way of strengthening self-control (Hung and Labroo 2011). Immediately prior to the reading task, participants were instructed to focus on either potential obstacles and temptations associated with the strategy (feasibility focus) or potential outcomes and benefits associated with the strategy (desirability focus). We manipulated anticipated effort indirectly by changing the font of the strategy description. Consistent with prior work (Alter and Oppenheimer 2008), participants in the low effort conditions read about the strategy in an easy-to-read font (i.e., 12-point, Times New Roman), whereas participants in the high effort conditions read about the same strategy in a difficult-to-

read font (i.e., 10-point, gray, italicized Arial). After reading about the strategy, participants answered several questions related to difficulty in understanding the strategy (0 = not difficult at all, 10 = very difficult), familiarity with the strategy (0 = no, 1 = yes), task involvement (0 = not involved at all, 10 = very involved), task enjoyment (0 = not at all, 10 = very much), and general affect (0 = bad, 10 = good). None of these variables were predicted by the manipulated factors and their interactions. Participants across conditions found the strategy equally easy to comprehend (M_{fluency} = .90 vs. $M_{\text{disfluency}}$ = .91; $F < 1$, NS).

Then, participants completed a filler task (product evaluations) designed to reduce the demand effect. After the filler task, participants performed the third task: a gold medal search task. They were told that their goal was to search for a gold medal among a large number of silver medals, and that on average, one out of 30 medals would be a gold medal. One medal would show up on the computer screen each time participants clicked on a search button; however, no gold medals were actually included in the design. Participants could stop the gold medal search whenever they liked. We used the number of rounds participants searched as an indicator of self-control (i.e., persistence). Participants indicated how much they enjoyed this gold medal search task (0 = not at all, 10 = very much), how much control they felt they had over becoming more persistent (0 = not at all, 10 = very much), and whether they used the "muscle-firming" strategy during the search task (0 = no, 1 = yes). Participants completed the same manipulation check measures used in previous experiments. Finally, participants answered demographic questions.

Four repetitive observations (based on IP address) were removed from the analysis. One participant who failed a test of understanding four times was also excluded from analysis. Thus, data from a final pool of 115 participants were analyzed.

Results and Discussion

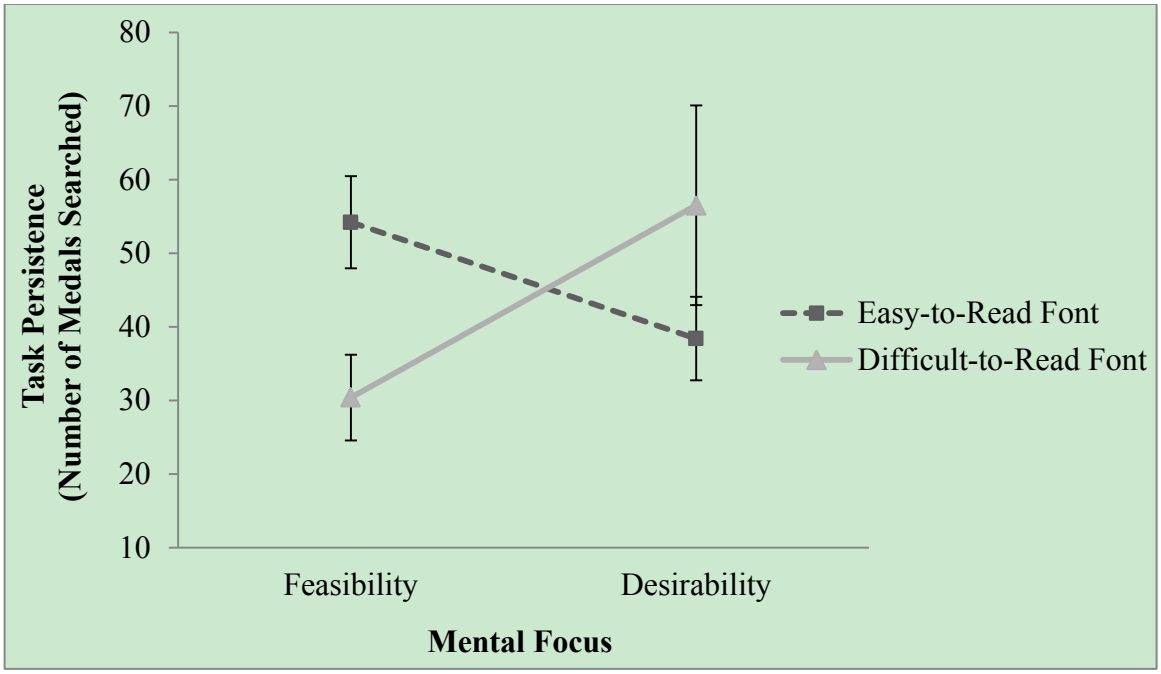
Manipulation Checks. A 2 (processing effort) x 2 (mental focus) ANOVA on the manipulation check measure of anticipated effort revealed only a main effect of processing effort ($F(1, 111) = 4.47$, $p = .039$). As expected, participants in the easy-to-read font conditions perceived the "muscle-firming" strategy to be less effortful ($M_{low} = 3.56$) than did those in the difficult-to-read font conditions ($M_{high} = 4.54$). Moreover, a 2 x 2 ANOVA on self-reported mental focus revealed only a main effect of mental focus ($F(1, 111) = 177.23$, $p < .001$). As expected, participants in the desirability focus conditions focused more on outcomes and benefits ($M_{desirability} = 7.62$), whereas participants in the feasibility focus conditions focused more on obstacles and temptations ($M_{feasibility} = 5.13$).

Self-Control. The self-control measure in this experiment was participants' persistence in the gold medal search task as indicated by the number of rounds (medals) they searched. We took a natural log transformation of this measure because it was positively skewed. We report the analyses based on this log-transformed persistence measure, but we used the means of the non-log-transformed persistence measure for ease of interpretation. We found similar results for both measures. A 2 x 2 ANOVA on persistence revealed only a significant interaction between processing effort and mental focus ($F(1, 111) = 6.26$, $p = .014$; see fig. 4). As expected, feasibility-focused participants

were less persistent in the gold medal search task after exposure to a difficult-to-read (vs. easy-to-read) self-control strategy (M_{low} = 54.2 vs. M_{high} = 30.4; $t(111) = 1.97$, $p = .025$, one-tailed), reflecting reduced self-control. However, contrary to our prediction, desirability-focused participants did not demonstrate greater persistence on the gold medal search task after exposure to a difficult-to-read (vs. easy-to-read) self-control strategy (M_{low} = 38.4 vs. M_{high} = 56.5; $t(111) = -1.56$, $p = .061$, one-tailed).

FIGURE 4

EXPERIMENT 2: TASK PERSISTENCE AS A FUNCTION OF PROCESSING EFFORT AND MENTAL FOCUS



NOTE.—Error bars denote standard errors.

Additional Analyses. A 2 x 2 ANOVA on the actual use of the self-control strategy revealed no significant effect (all *p's* > .33). That is, participants across conditions were equally likely to use the strategy in the gold medal search task (ratio ranging from 36% to 52%, $p = .61$). Importantly, the interaction between processing effort and mental focus remained statistically significant ($p = .004$) after controlling for strategy use ($p = .066$). Finally, a 2 x 2 ANOVA on perceived level of control revealed only a marginally significant effect of mental focus, such that feasibility-focused participants ($M = 7.64$) reported greater perceived control than desirability-focused participants ($M = 6.98$; $F(1, 111) = 3.24$, $p = .075$). The processing effort x mental focus interaction still predicted task persistence ($p = .005$) after controlling for perceived control ($p = .73$).

Discussion. In experiment 2, we found that greater anticipated effort associated with using a strategy undermined subsequent motivation to exert self-control when individuals were feasibility focused, supporting H1a. However, we failed to find evidence for H1b that greater anticipated effort facilitated subsequent motivation to exert self-control when individuals were desirability focused (although means were in the predicted direction). This is likely due to the small sample size and the subtle, indirect manipulation of anticipated effort (i.e., easy- or difficult-to-read font). Although participants in the difficult-to-read (vs. easy-to-read) font conditions perceived the "muscle-firming" strategy to be relatively more effortful, they did not consider it to be an objectively high-effort strategy, since the anticipated effort rating ($M_{high} = 4.54$) did not differ significantly from the mid-point of the scale (i.e., 5; $p = .23$). In this experiment, we demonstrated that the interactive effect of anticipated effort and mental focus operates independently of

actual strategy use. We also ruled out perceived control as an alternative explanation. In the following two experiments, we aimed to deepen our understanding of this phenomenon by directly probing into the underlying psychological process.

CHAPTER 6: EXPERIMENT 3

Experiment 3 was designed to deepen our understanding of this phenomenon by investigating the underlying process (H2) of the interactive effect between anticipated effort and mental focus on self-control. We predicted that under a feasibility focus, anticipated effort has a direct negative effect on self-control, whereas under a desirability focus, anticipated effort has an indirect positive effect on self-control by enhancing the perceived value of a corresponding self-control goal.

In experiment 3, we manipulated desirability versus feasibility focus in a different fashion by using outcome versus process mental simulation. Taylor and Schneider (1989) suggested that people often engage in mental simulation in daily life. Mental simulation can be classified into outcome and process simulation. Outcome simulation involves envisioning the end benefits or accomplishment associated with a desired outcome, whereas process simulation involves envisioning the progressive steps that must be taken to achieve a desired outcome (Pham and Taylor 1999; Taylor et al. 1998). Outcome simulation is an abstract mental representation reflecting desirability focus, whereas process simulation is a concrete mental representation reflecting feasibility focus (Thompson, Hamilton, and Petrova 2009). Thus, we used outcome versus process simulation as a proxy for desirability versus feasibility focus. In this experiment, we tested our predictions in a healthy eating (calorie intake control) context. Obesity is one of the most common self-control problems, and is becoming an increasing concern in the

United States. As of 2012, over one third of American adults were obese (Ogden, Carroll, Kit, and Flegal 2014).

Method

We recruited 113 participants (37% female; four individuals' gender information was missing) from across the United States via Amazon Mechanical Turk. Participants were compensated with a small amount of money. This experiment employed a 2 (anticipated effort: low vs. high) x 2 (mental simulation: outcome vs. process) between-subjects design. Participants were asked to participate in two ostensibly unrelated studies. Participants first read about a self-control strategy (the "eat slow" strategy; see Appendix D) for maintaining physical health under the pretense of understanding people's imagination skills. Past research has shown that eating at a slower rate results in reduced calorie intake (e.g., Andrade et al. 2008). Anticipated effort was manipulated in a similar way to experiment 1a. After reading about the strategy, participants were instructed to close their eyes and spend 30 seconds mentally simulating either the specific steps (process simulation conditions) or the end benefits (outcome simulation conditions) of adopting the strategy. Instructions for mental simulation were adapted from prior research (Escalas and Luce, 2003, 2004; see Appendix E). Participants then wrote down their thoughts during the mental simulation. Next, participants reported the level of effort required by the "eat slow" strategy (0 = none, 10 = a lot), perceived strategy effectiveness, perceived familiarity with the strategy, perceived task enjoyment, perceived distraction

during the task, and task involvement on 11-point scales (0 = not at all, 10 = very much). We also measured affect (0 = bad/negative/unhappy, 10 = good/positive/happy).

Participants then proceeded to an ostensibly unrelated second study on consumer preferences. In this study, participants indicated their preferences across different product categories, among which our key dependent measures were embedded. One dependent measure was participants' interest in eating a series of food items (with pictures). Specifically, participants reported their interest in eating each of eight food items, including four healthy snacks (i.e., apple, baby carrots, granola bar, and raisins) and four unhealthy snacks (i.e., ice cream, chocolate bar, doughnut, and chips). The presentation order of the food items was randomized. A pretest conducted with a separate sample from the same population (i.e., MTurk participants, N = 134) confirmed that those food items were indeed perceived to be healthy or unhealthy as expected; that is, ratings differed significantly from the mid point on an 11-point scale (all *p's* < .001). Another dependent measure was participants' expected exercise frequency in the coming month (0 = very infrequently, 10 = very frequently).

Next, participants reported perceived importance of physical health ("Physical health is important to me;" "I am concerned about my physical health") on 7-point scales (1 = strongly disagree, 7 = strongly agree). Moreover, we asked participants how hungry they were at the moment, and whether they were on a diet. Finally, participants answered demographic questions.

Results and Discussion

Manipulation Checks. Two independent coders who were blind to the experimental conditions were recruited to code the participants' thoughts on the "eat slow" strategy in terms of outcome (desirability) or process (feasibility) focus. The two coders' outputs were highly correlated ($r_{outcome}$ = .882, p < .001; $r_{process}$ = .828, p < .001). High interclass correlations were also observed between the two coders ($r_{outcome}$ = .934; $r_{process}$ = .869). Thus, we created an outcome simulation index and a process simulation index (averaged across coders). As expected, a 2 (anticipated effort) x 2 (mental simulation) ANOVA on the outcome simulation index revealed only a significant main effect of mental simulation ($M_{outcome}$ = 2.03 vs. $M_{process}$ = 0.29; F(1, 109) = 71.22, p < .001). Similarly, a 2 x 2 ANOVA on the process simulation index revealed only a significant main effect of mental simulation ($M_{outcome}$ = 0.61 vs. $M_{process}$ = 2.35; F(1, 109) = 58.23, p < .001). Thus, the manipulation of outcome versus process simulation was successful. Furthermore, a 2 x 2 ANOVA on perceived level of effort required by the "eat slow" strategy revealed only a significant main effect of anticipated effort (M_{low} = 5.31 vs. M_{high} = 6.83; F(1, 109) = 8.58, p = .004), confirming the success of the anticipated effort manipulation.

Self-Control: Interest in Healthy Food. In line with previous research (Zhang et al. 2008), we collapsed responses to the eight food items (with reverse coding for unhealthy food items) and developed a composite measure of participants' interest in healthy food. We performed a 2 (anticipated effort) x 2 (mental simulation) ANOVA on interest in healthy food. Consistent with our prediction, this analysis yielded a significant interaction

between anticipated effort and mental simulation ($F(1, 109) = 6.32$, $p = .013$; see figure 5). No main effects were significant (all $F's < 1$, NS). Planned contrasts were performed to understand the nature of this interaction. Results indicated that under the process simulation (feasibility focus) conditions, anticipated effort associated with the strategy did not affect interest in healthy food ($M_{low} = 5.15$ vs. $M_{high} = 4.50$; $t(109) = -1.52$, $p = .066$, one-tailed). In contrast, under the outcome simulation (desirability focus) conditions, greater anticipated effort led to greater interest in healthy food ($M_{low} = 4.49$ vs. $M_{high} = 5.38$; $t(109) = 2.03$, $p = .022$, one-tailed).

We also performed ANOVAs on each of the eight food items (see table 2) and found the predicted effect was driven by changes in interest in healthy (vs. unhealthy) food. Thus, we created a different composite measure of participants' interest in healthy food based on the four healthy food items. A 2 x 2 ANOVA revealed a predicted anticipated effort x mental simulation interaction ($F(1, 109) = 12.65$, $p = .001$). As predicted, participants in the process simulation conditions exhibited greater interest in healthy food when the strategy was portrayed as requiring low (vs. high) effort ($M_{low} = 6.87$ vs. $M_{high} = 5.59$; $t(109) = -2.49$, $p = .007$, one-tailed), whereas participants in the outcome simulation conditions exhibited greater interest in healthy food when the strategy was positioned as requiring high (vs. low) effort ($M_{low} = 5.72$ vs. $M_{high} = 7.04$; $t(109) = 2.54$, $p = .006$, one-tailed).

Moreover, this interactive effect remained significant ($F(1, 103) = 11.54$, $p = .001$)[3] after controlling for hunger ($p = .498$), diet ($p = .249$), and strategy familiarity (p

[3] Hunger and diet information were missing for three participants. With respect to interest in healthy food based on all eight food items, the anticipated effort x mental simulation interaction also remains significant ($F(1, 103) = 7.73$, $p = .006$) after controlling for hunger ($p = .004$), diet ($p = .549$), and strategy familiarity ($p = .924$).

= .77). Finally, perceived strategy effectiveness, perceived distraction during the task, task involvement, and affect did not differ across conditions. Participants in the high effort conditions enjoyed the "imagination skills" task more than those in the low effort conditions (M_{low} = 7.10 vs. M_{high} = 8.02; $F(1, 109) = 3.92$, $p = .05$)[4].

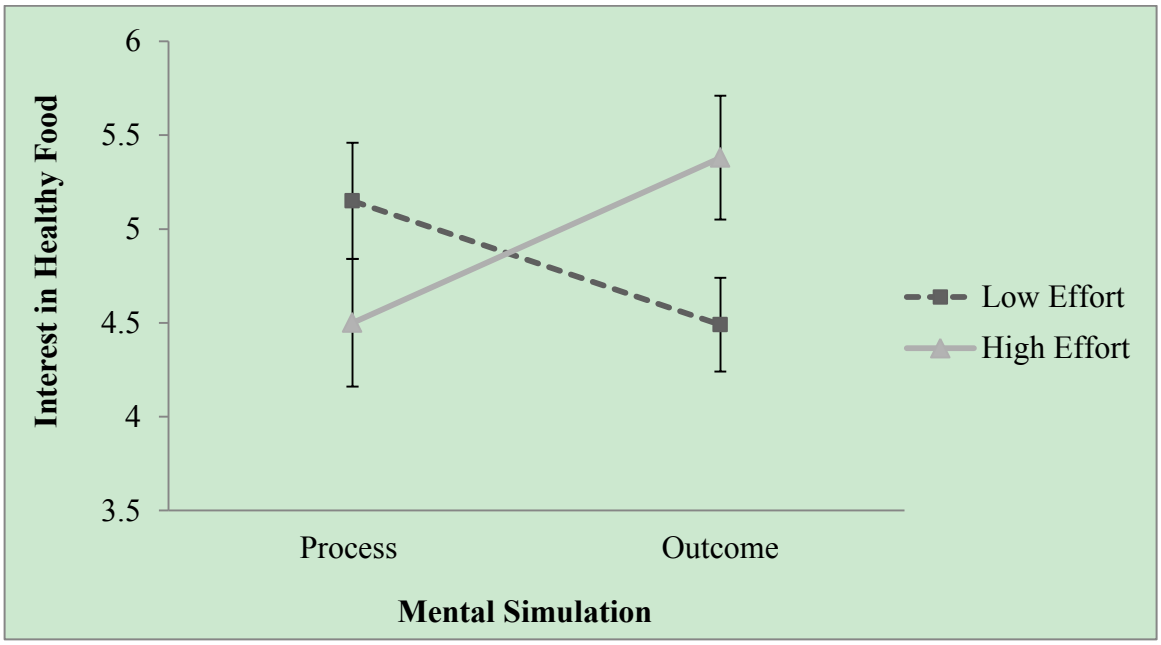
Self-Control: Planned Exercise Frequency. We also performed a 2 (anticipated effort) x 2 (mental simulation) ANOVA on planned exercise frequency. As predicted, a significant interaction between anticipated effort and mental simulation emerged ($F(1, 109) = 7.81$, $p = .006$; see figure 6). Neither the main effect of anticipated effort ($F < 1$, NS) nor the main effect of mental simulation ($F(1, 109) = 1.15$, $p > .28$) was statistically significant. As expected, planned contrasts showed that in the process simulation conditions, greater anticipated effort reduced planned exercise frequency (M_{low} = 6.90 vs. M_{high} = 5.0; $t(109) = -2.39$, $p = .009$, one-tailed), indicating lower self-control. However, counter to our prediction, in the outcome simulation conditions, anticipated effort did not affect planned exercise frequency (M_{low} = 5.93 vs. M_{high} = 7.18; $t(109) = 1.56$, $p = .061$, one-tailed)[5].

[4] In this experiment, we also included a control condition in which neither anticipated effort nor mental simulation was manipulated. Instead, participants in the control condition read about an unrelated scientific report. Participants in the control condition directionally exhibited greater (less) interest in healthy food than did those in the low effort-outcome simulation condition and high effort-process simulation condition (in the low effort-process simulation condition and high effort-outcome simulation condition). However, only the difference between the high effort-outcome simulation condition ($M = 5.38$) and the control condition ($M = 4.68$) was significant ($t(54) = 1.76$, $p = .042$).

[5] Compared to participants in the control condition ($M = 5.64$), participants in the low effort-process simulation condition ($M = 6.90$, $t(56) = 1.72$, $p = .046$) and the high effort-outcome simulation condition ($M = 7.18$, $t(54) = 1.99$, $p = .026$) expressed higher planned exercise frequency. There were no differences between the control condition and each of the other two treatment conditions (p's > .47).

FIGURE 5

EXPERIMENT 3: INTEREST IN HEALTHY FOOD AS A FUNCTION OF ANTICIPATED EFFORT AND MENTAL SIMULATION



NOTE.—Error bars denote standard errors.

TABLE 2

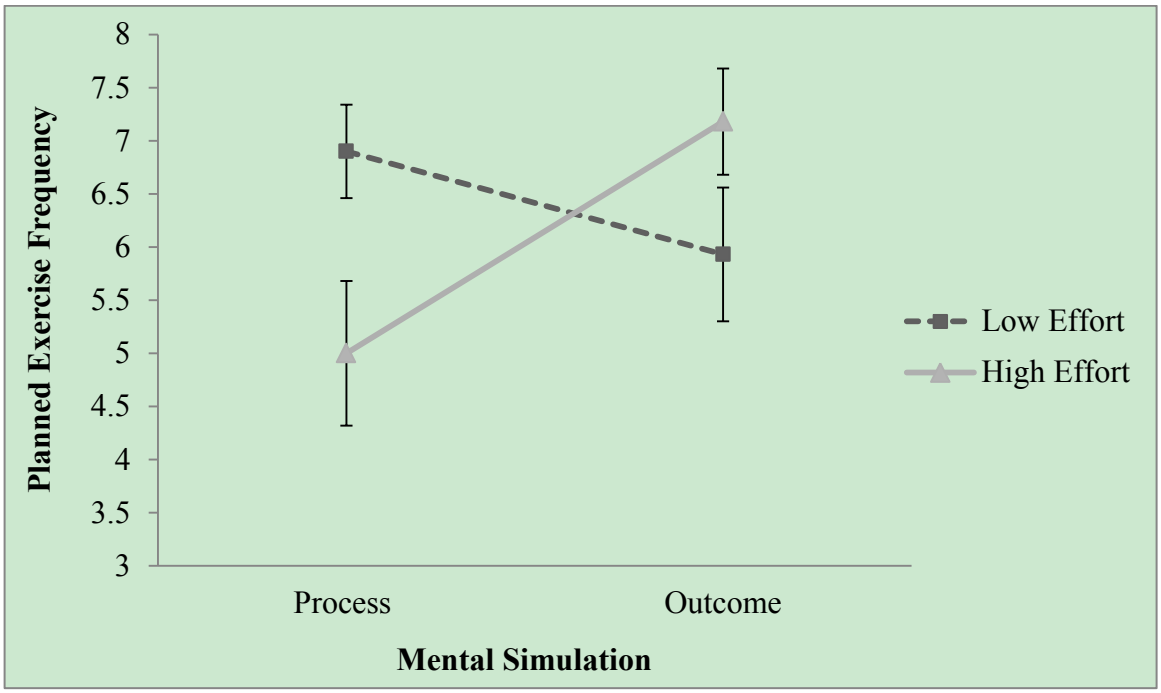
EXPERIMENT 3: INTEREST IN EACH OF THE EIGHT FOOD ITEMS AS A FUNCTION OF ANTICIPATED EFFORT AND MENTAL SIMULATION

Effort x Simulation	*F*-statistic (*df* = 109)	*p*-value
Apple	5.59	.020
Baby Carrots	4.26	.041
Veggie Burger	1.25	.266
Granola Bar	15.30	< .001
Ice Cream	.05	.820
Chips	.18	.671
Bacon Cheeseburger	.41	.525
Candy Bar	.06	.803

NOTE.—Neither the main effect of anticipated effort nor the main effect of mental simulation was significant.

FIGURE 6

EXPERIMENT 3: PLANNED EXERCISE FREQUENCY AS A FUNCTION OF ANTICIPATED EFFORT AND MENTAL SIMULATION



NOTE.—Error bars denote standard errors.

Moderated Mediation. We predicted that perceived goal importance mediates the effect of anticipated effort on self-control under a desirability focus (outcome simulation), but not under a feasibility focus (process simulation). We collapsed the two goal importance items to create a composite measure of perceived goal importance (Cronbach's $\alpha = .73$). Three observations had missing values on this measure, which led to a sample size of 110 for this mediation analysis. Following the procedure recommended by Muller and colleagues (Muller, Judd, and Yzerbyt 2005), we first regressed interest in healthy food on anticipated effort, mental simulation, and their interaction. Consistent with prior ANOVA results, this analysis yielded only a significant

interaction term (β = .387, t(106) = 2.51, p = .013). Then, perceived goal importance was regressed on anticipated effort, mental simulation, and their interaction, which revealed only a significant interaction term (β = .261, t(106) = 2.26, p = .026). Furthermore, perceived goal importance predicted interest in healthy food (β = .459, t(108) = 3.76, p < .0005). Finally, we regressed interest in healthy food on anticipated effort, mental simulation, their interaction, and perceived goal importance. The results revealed that the effect of perceived goal importance was significant (β = .412, t(105) = 3.28, p = .001), whereas the effort by simulation interaction became marginally significant (β = .293, t(105) = 1.91, p = .058). These results confirm the mediating role of perceived goal importance. Furthermore, as suggested by recent literature (Preacher and Hayes 2008; Zhao, Lynch, and Chen 2010), we performed a bootstrapping analysis that generated a sample size of 5,000 (Hayes 2012; Preacher, Rucker, and Hayes 2007). In support of our prediction, perceived goal importance mediated the effect of anticipated effort on interest in healthy food in the outcome simulation conditions (indirect effect = .12; 95% CI: .0116 to .2953), but not in the process simulation conditions (indirect effect = -.09; 95% CI: -.2655 to .0311).

The same analysis was also performed for planned exercise frequency. To be specific, we first regressed planned exercise frequency on anticipated effort, mental simulation, and their interaction. This analysis yielded only a significant interaction (β = .788, t(106) = 2.80, p = .006). Then, perceived goal importance was regressed on the same variables, which revealed only a significant interaction term (β = .261, t(106) = 2.26, p = .026). Furthermore, perceived goal importance predicted planned exercise frequency (β = 1.078, t(108) = 4.92, p < .0005). Finally, we regressed planned exercise frequency on

anticipated effort, mental simulation, their interaction, and perceived goal importance. The results revealed that the effect of perceived goal importance was significant (β = .969, $t(105) = 4.34$, $p < .001$), whereas the interaction between anticipated effort and mental simulation decreased in significance (β = .553, $t(105) = 2.03$, $p = .045$), confirming the mediating role of perceived goal importance. Then, we performed a bootstrapping analysis that generated a sample size of 5,000. In support of our hypothesis, perceived goal importance mediated the effect of anticipated effort on planned exercise frequency in the outcome simulation conditions (indirect effect = .29; 95% CI: .0215 to .7073), but not in the process simulation conditions (indirect effect = -.22; 95% CI: -.6212 to .0861).

Discussion. By employing the "eat slow" strategy in a health maintenance setting, we replicated the findings of the previous experiments (H1a and H1b) that the interplay between anticipated effort associated with the strategy and desirability versus feasibility focus (outcome vs. process simulation) determines subsequent motivation to exercise self-control. More importantly, this experiment provided direct evidence for the psychological mechanism (H2) underlying this effect by showing that under a feasibility focus, anticipated effort signals the energy demand of the strategy and has a direct negative effect on subsequent self-control, but under a desirability focus, anticipated effort boosts subsequent self-control by increasing perceived importance of the associated self-control goal.

CHAPTER 7: EXPERIMENT 4

In experiment 4, we aimed to provide further evidence for the underlying mechanism (H2) behind the proposed effect and to extend the effect to a new self-control setting (overcoming procrastination), in which participants had an opportunity to use a given self-control strategy when confronted with a subsequent self-control dilemma. Procrastination is an extremely prevalent and severe self-control problem (Steel 2007). About 15%-20% of adults are chronically affected by procrastination (Harriott and Ferrari 1996), and almost 50% of college students procrastinate consistently and problematically (Day, Mensink, and O'Sullivan 2000).

In this experiment, we manipulated desirability and feasibility focus by varying people's levels of construal. According to construal level theory (Liberman and Trope 1998; Trope and Liberman 2003, 2010), higher-level construals highlight the desirability associated with an event, whereas lower-level construals highlight the feasibility of the event. To further increase the generality of our findings, we primed participants' levels of construal independent of the focal strategy-reading task and demonstrated that an incidentally activated mental focus is sufficient to affect the way effort information on a given strategy is interpreted.

Unlike the previous experiments, experiment 4 adopted a cognitive (instead of behavioral) self-control strategy, namely the "self-talk" strategy (i.e., talking to oneself). Prior research has suggested the self-regulating function of self-talk (e.g., Diaz and Berk 1992; Kross et al. 2014; Mischel, Cantor, and Feldman 1996; Patrick and Hagtvedt 2012).

Method

We recruited 245 participants (51% female) from across the United States via Amazon Mechanical Turk. Participants passed an attention trap prior to the main experiment and received a small monetary compensation for their participation. This experiment employed a 2 (anticipated effort: low vs. high) x 2 (construal level: low vs. high) between-subjects design. Participants were randomly assigned to one of the four conditions. All participants were told that they were going to participate in a series of unrelated tasks.

In the first task, participants completed the construal level priming task (adapted from Freitas, Gollwitzer, and Trope 2004). Depending on the experimental conditions, participants were asked to answer a series of increasingly abstract (concrete) questions regarding why (how) to maintain good physical health. While answering "why" questions induces higher levels of construal, answering "how" questions engenders lower levels of construal. Next, participants completed the second task under the cover story of understanding information processing. In this task, participants read about the "self-talk" strategy for overcoming procrastination (see Appendix F). Similar to the procedure in experiments 1a and 3, anticipated effort was manipulated within the strategy description. Then, participants responded to a series of measures including manipulation check measures, attitude toward the strategy, strategy familiarity (0 = no, 1 = yes), task involvement, task enjoyment, and perceived distraction during the reading task (all on a 11-point scale except for strategy familiarity).

Next, participants performed a short filler task. Upon completion of the filler task, participants moved on to the final task during which the focal dependent measure was collected. Specifically, participants were told they were going to perform two tasks within a time limit of 10 minutes, which created a procrastination situation. Specifically, the first task was to play a fun Tetris game while the second task was to work on a boring writing task for which the top 50% performers would qualify for an opportunity to win a $2 bonus based on a random draw. The Tetris game was interesting yet inconsequential, whereas the writing task was boring but consequential. Participants were free to allocate their 10 minutes between the two tasks. The Tetris game was always presented as the first task, and participants could not go back to the Tetris game once they proceeded to the writing task (and the amount of time left for the writing task was displayed on the computer screen). Thus, the time spent playing the Tetris game (ranging from 0 to 10 minutes) reflected the level of procrastination: the longer a participant spent playing the Tetris game, the lower self-control this participant exhibited. Prior to the two tasks, participants indicated their expected enjoyment with and perceived importance of each of the two tasks, which served as a manipulation check.

Upon completion of the two tasks, participants responded to a series of measures including perceived goal importance ("Beating procrastination is important to me," "I take the issue of procrastination seriously," "I don't worry much about overcoming procrastination" (reverse coded); 0 = strongly disagree, 10 = strongly agree; Cronbach's α = .84), self-efficacy expectancy ("Avoiding procrastination is easy for me," "I am fairly good at beating procrastination," "It is difficult for me to overcome procrastination" (reverse coded); 0 = strongly disagree, 10 = strongly agree; Cronbach's α = .92), and the

frequency of playing Tetris (0 = strongly disagree, 10 = strongly agree). Participants also reported the extent to which they used the "self-talk" strategy when performing the two tasks (0 = not at all, 10 = very much). In addition, participants' chronic procrastination tendency was measured (six items, 5-point scale adopted from Tuckman (1991) ("I needlessly delay finishing jobs, even when they are important," "I postpone starting in on things I don't like to do," "When I have a deadline, I wait till the last minute," "I manage to find an excuse for not doing something," "I promise myself I will do something and then drag my feet," "Even though I hate myself if I don't get started, it doesn't get me going;" 1 = that's me for sure, 5 = that's not me for sure; Cronbach's $\alpha = .91$).

We analyzed data from 232 participants. Five participants did not follow the instructions of the construal level manipulation and eight participants did not read the description of the self-control strategy, thus their data were excluded from the analyses.

Results and Discussion

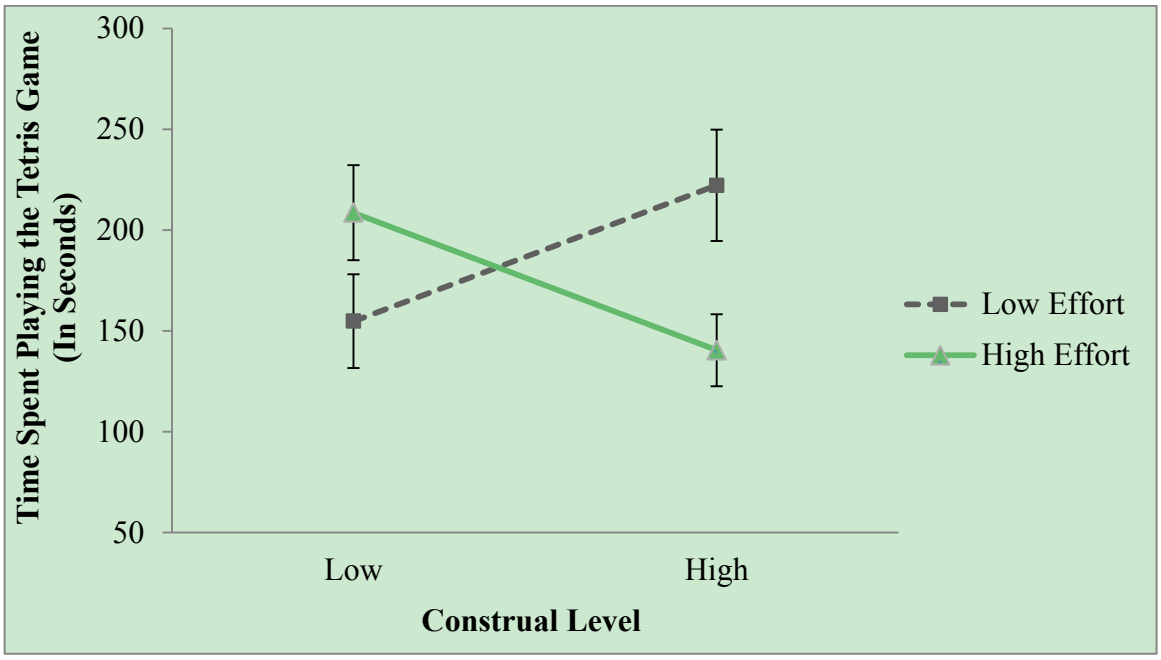
Manipulation Checks. As intended, a 2 (anticipated effort) x 2 (construal level) ANOVA confirmed that participants perceived the high-effort strategy to be more effortful than the low-effort strategy ($M_{high} = 7.43$ vs. $M_{low} = 1.25$; $F(1, 228) = 486.89$, $p < .001$). Neither the main effect of construal level nor the anticipated effort x construal level interaction was significant (all $F's < 1$, NS). Similarly, a 2 x 2 ANOVA on mental focus revealed only a main effect of construal level ($M_{high} = 5.97$ vs. $M_{low} = 3.92$; $F(1, 228) = 28.22$, $p < .001$), confirming the success of the construal level manipulation. Furthermore, results indicated that participants expected the Tetris game to be more

interesting (M_{Tetris} = 7.09 vs. $M_{writing}$ = 4.35; $p < .001$) yet less consequential (M_{Tetris} = 2.26 vs. $M_{writing}$ = 7.28; $p < .001$) than the writing task, confirming the procrastination paradigm.

Self-Control. The self-control measure in this experiment was the time participants spent playing the Tetris game (procrastination); that is, the longer a participant spent playing the game, the less self-control this participant exhibited (i.e., greater procrastination). We performed a 2 (anticipated effort) x 2 (construal level) ANOVA on time spent playing the Tetris game. Replicating the findings of previous experiments, a significant anticipated effort by construal level interaction emerged ($F(1, 228) = 8.51$, $p = .004$; see figure 7). Neither the main effect of anticipated effort ($F < 1$, NS) nor the main effect of construal level ($F < 1$, NS) was statistically significant. As expected, planned contrasts showed that in the low construal level conditions, greater anticipated effort led to more time spent playing the Tetris game (M_{low} = 154.8 seconds vs. M_{high} = 208.6 seconds; $t(228) = -1.63$, $p = .05$, one-tailed), indicating reduced self-control. By contrast, in the high construal level conditions, greater anticipated effort led to less time spent playing the Tetris game (M_{low} = 222.2 seconds vs. M_{high} = 140.4 seconds; $t(228) = 2.49$, $p = .006$, one-tailed), indicating increased self-control.

FIGURE 7

EXPERIMENT 4: PROCRASTINATION AS A FUNCTION OF ANTICIPATED EFFORT AND CONSTRUAL LEVEL



NOTE.—Error bars denote standard errors.

Moderated Mediation. Following the recommended procedure (Muller, Judd, and Yzerbyt 2005), we first regressed procrastination on anticipated effort, construal level, and their interaction. Consistent with prior ANOVA results, this analysis yielded only a significant interaction term (β = -33.89, $t(228)$ = -2.92, p = .004). Then, perceived goal importance was regressed on the same set of variables, which revealed only a significant interaction term (β = .332, $t(228)$ = 2.51, p = .013). Furthermore, perceived goal importance predicted procrastination (β = -21.83, $t(228)$ = -3.87, $p < .0001$). Finally, we regressed procrastination on anticipated effort, construal level, their interaction, and perceived goal importance. The results revealed that the effect of perceived goal

importance was significant (β = -19.48, t(228) = -3.42, p = .001), whereas the significance level of the anticipated effort by construal level interaction decreased (β = -27.42, t(228) = -2.38, p = .018). These results confirm the mediating role of perceived goal importance. Furthermore, we performed a bootstrapping analysis that generated a sample size of 5,000 (Hayes 2012; Preacher, Rucker, and Hayes 2007). In support of our theorizing, a 95% confidence interval (CI) for the indirect effect of anticipated effort through perceived goal importance was significant under high level of construal (indirect effect = -8.65; 95% CI: -22.0844 to -1.3403), but not under low level of construal (indirect effect = 4.30; 95% CI: -1.9817 to 16.0272).

Actual Strategy Use. A competing explanation for this interactive effect is that, in the low (high) construal level conditions, participants were more likely to use the "self-talk" strategy when it was portrayed as effortless (effortful), which in turn enhanced self-control. To test this account, we conducted a 2 x 2 ANOVA on actual use of the strategy. Only a directional anticipated effort by construal level interaction was observed (p = .106), such that in the low construal level conditions, participants were marginally more likely to use the strategy when anticipated effort was low than when it was high (M_{low} = 3.78 vs. M_{high} = 2.79; t(226) = 1.62, p = .053)[6], whereas this pattern was directionally reversed in the high construal level conditions (M_{low} = 3.15 vs. M_{high} = 3.57; t < 1, p > .25). Notably, the anticipated effort by construal level interaction (F(1, 225) = 7.25, p = .008) still predicted self-control (procrastination) after controlling for actual strategy use (p = .20). Moreover, results of a bootstrapping analysis did not support the mediating role of actual strategy use in the low construal level conditions (95% CI: -.7382 to 9.2303) nor in the high construal level conditions (95% CI: -7.4350 to 1.3331).

[6] Actual strategy use information was missing for two participants.

Self-Efficacy Expectancy. According to our framework, under a feasibility focus, anticipated effort associated with using a strategy exerts a direct negative influence on subsequent motivation to exercise self-control, because anticipated effort serves as the energy demand of the strategy, which constitutes the restraining force opposing goal-directed behavior. However, an alternative explanation is that anticipated effort may affect the motivation to exert self-control by changing people's self-efficacy beliefs pertaining to self-control abilities. Thus, it is possible that the contemplation of the low-effort (vs. high-effort) "self-talk" strategy enhanced participants' confidence in their abilities to overcome procrastination, thereby resulting in decreased procrastination (i.e., reduced time spent playing the Tetris game). To test this possible explanation, we performed a 2 x 2 ANOVA on self-efficacy expectancy. However, we observed no effects of anticipated effort, construal level, or their interaction on self-efficacy expectancy (all *p's* > .62). The anticipated effort x construal level interaction remained significant ($F(1, 227) = 8.61$, $p = .004$) after controlling for self-efficacy expectancy ($p = .34$). Moreover, results from a bootstrapping analysis did not support the mediating role of self-efficacy expectancy in the low construal level conditions (95% CI: -5.8040 to 1.1252) nor in the high construal level conditions (95% CI: -3.2614 to 3.5824). Thus, self-efficacy expectancy was ruled out as an explanation for the effect.

Additional Analyses. A 2 x 2 ANOVA on attitude toward the strategy yielded a significant main effect of anticipated effort ($F(1, 228) = 4.03$, $p = .046$), which was qualified by a marginally significant interaction between anticipated effort and construal level ($F(1, 228) = 3.07$, $p = .081$). Specifically, in the low construal level conditions, participants favored the low-effort strategy more than the high-effort strategy (M_{low} =

8.31 vs. M_{high} = 7.13; $t(228) = 2.66$, $p = .004$), whereas no difference was observed in the high construal level conditions ($p > .42$). It seemed that a higher level of construal (a desirability focus) could counteract the aversiveness of effort associated the strategy, but it was not powerful enough to reverse the effect. Furthermore, the predicted interaction between anticipated effort and construal level remained significant ($F(1, 227) = 8.70$, $p = .004$) after controlling for participants' attitudes toward the strategy ($p = .62$). Moreover, results from a bootstrapping analysis failed to support the mediating role of attitude in either the low construal level conditions (95% CI: -8.5514 to 4.0375) or the high construal level conditions (95% CI: -3.8563 to 1.9943). Thus, attitude toward the self-control strategy was ruled out as an explanation for the effect.

In addition, 2 x 2 ANOVAs on reading task involvement, reading task enjoyment, perceived distraction during the reading task, and trait procrastination revealed no significant effect (all p's > .11). The interactive effect between anticipated effort and construal level remained significant ($F(1, 223) = 7.98$, $p = .005$) after controlling for task involvement ($p = .28$), task enjoyment ($p = .91$), perceived distraction ($p = .09$), strategy familiarity ($p = .32$), and frequency of playing Tetris ($p = .17$). Thus, these factors were ruled out as alternative explanations for the effect.

Discussion. Consistent with the results of previous experiments, the results of experiment 4 provided converging evidence that the effect of anticipated effort associated with using a self-control strategy on subsequent self-control is moderated by mental focus (induced by construal level; H1a and H1b). We demonstrated this effect in a new self-control domain (anti-procrastination) with an incidentally activated mental focus and a behavioral self-control measure. Furthermore, our results provide further evidence for the

proposed underlying mechanism (H2) by showing that perceived goal importance mediated the effect of anticipated effort on self-control under a desirability focus, but not under a feasibility focus, and by ruling out several alternative explanations including actual strategy use, self-efficacy expectancy, and trait procrastination, among others.

CHAPTER 8: EXPERIMENT 5

So far, we have demonstrated that across a variety of self-control domains, the same effort information on a self-control strategy can lead to opposite motivational consequences, depending on whether individuals are feasibility or desirability focused. However, in all previous experiments, we explicitly required participants to focus either on desirability or feasibility. It remained unaddressed whether and when individuals would naturally or automatically focus on feasibility or desirability when striving to accomplish a self-control goal. In experiment 5, we sought to demonstrate that desirability versus feasibility focus, instead of being directly primed, could naturally arise when individuals are at different stages of goal pursuit.

Prior research has shown that individuals in early stages of goal pursuit are concerned about whether they can attain a specific goal, whereas individuals in advanced stages of goal pursuit are concerned about whether the goal is indeed important or valuable to them (Zhang and Huang 2010). For instance, a consumer has set a weight loss goal to lose 10 pounds. This consumer will initially question whether losing 10 pounds is ultimately attainable if she or he has lost just 1 pound (i.e., a feasibility focus). In contrast, if this consumer has already lost 9 pounds, she or he will feel relatively certain about goal attainment. In this case, this consumer will focus on to what extent she or he values the attainment of losing 10 pounds (i.e., a desirability focus). Thus, we expect that people will shift their focus from feasibility to desirability as they progress toward achieving a

self-control goal. In experiment 5, we sought to induce a feasibility/desirability focus by manipulating different stages of the pursuit of a self-control goal.

Method

Two hundred and fifteen MTurk workers (44% female) participated in this experiment in exchange for a small amount of money. This experiment used a 2 (anticipated effort: low vs. high) x 2 (stage of goal pursuit: initial vs. advanced) between-subjects design. Participants were randomly assigned to one of the four conditions.

Participants completed a gold medal search task similar to that in experiment 2. Several changes were made in this design. To be specific, participants in initial stage conditions were told that their goal was to find a total of five gold medals among a large number of silver medals. They imagined that they had already found one goal medal and they needed to find four more gold medals to reach their target of five gold medals. Participants in advanced stage conditions were told that their goal was to find a total of ten gold medals among a large number of silver medals. They imagined that they had already found six goal medals and they need to find four more gold medals to reach their target of ten gold medals. Thus, we held the discrepancy between participants' current position and final goal attainment constant across conditions. Next, right before proceeding to the gold medal search task, participants read about the "muscle-firming" strategy (Hung and Labroo 2011), which was described as a means of bolstering willpower and persistence on search tasks. Anticipated effort associated with the strategy was manipulated in a similar way as in experiment 1A, 3, and 4. After performing the

gold medal search task, participants reported their task involvement (0 = not involved at all, 10 = very involved), task enjoyment (0 = not at all, 10 = very much), and general affect (0 = bad, 10 = good). Participants also indicated whether they actually used the self-control strategy during the gold medal search task (0 = no, 1 = yes). Finally, participants' demographic information was collected. We removed eight repetitive observations (based on IP address) from the analysis, leaving a final pool of 207 participants.

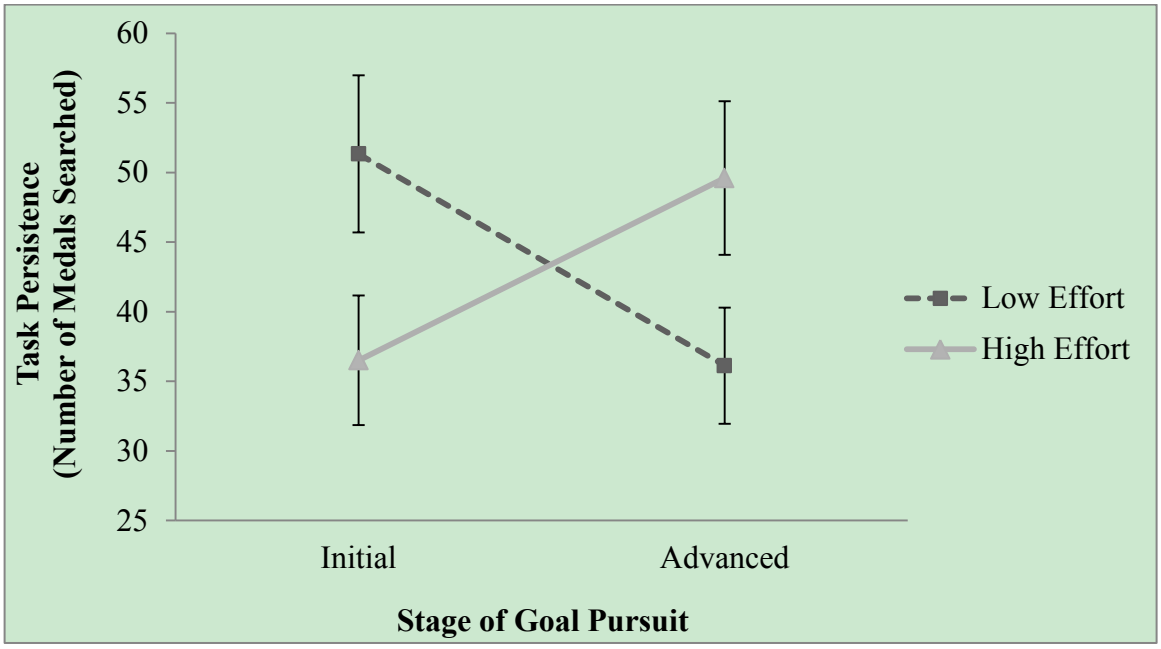
Results and Discussion

Self-Control. The self-control measure in this experiment was participants' persistence on the gold medal search task (i.e., number of rounds/medals searched). Although we report the results of the analyses based on the log-transformed persistence measure, we used the means of non-log-transformed persistence measure for ease of interpretation. We found the same results for both measures. An ANOVA of task persistence yielded the hypothesized anticipated effort x stage of goal pursuit interaction ($F(1, 203) = 10.92$, $p = .001$; see figure 8). No other effects emerged in this analysis. Specifically, participants in the initial stage conditions demonstrated greater task persistence after reading about a low-effort (vs. high-effort) self-control strategy ($M_{low} = 51.33$ vs. $M_{high} = 36.51$; $t(203) = 2.40$, $p = .008$, one-tailed). Conversely, participants in the advanced stage conditions demonstrated greater task persistence after reading about a high-effort (vs. low-effort) self-control strategy ($M_{low} = 36.13$ vs. $M_{high} = 49.60$; $t(203) = -2.28$, $p = .012$, one-tailed). Moreover, controlling for actual strategy use ($p = .39$), task

involvement ($p < .001$), task enjoyment ($p = .64$), and general affect ($p = .081$) did not change the significance of this interactive effect ($F(1, 199) = 9.79$, $p = .002$).

FIGURE 8

EXPERIMENT 5: TASK PERSISTENCE AS A FUNCTION OF ANTICIPATED EFFORT AND STAGE OF GOAL PURSUIT



NOTE.—Error bars denote standard errors.

Discussion. Experiment 5 provided further support for our hypotheses with a different manipulation of mental focus. Instead of directly priming it, we used initial or advanced stages of goal pursuit to trigger a feasibility or desirability focus, respectively. Specifically, we found that greater anticipated effort associated with a self-control strategy led to weakened task persistence when individuals perceived they were in an initial stage of goal pursuit (H1a). Conversely, greater anticipated effort associated with a

self-control strategy led to greater task persistence when individuals perceived they were in an advanced stage of goal pursuit (H1b). We observed this effect even though the objective stage of goal pursuit was constant across conditions. Again, we demonstrated that this effect was not due to different strategy adoption rates across conditions. Of note, past research on goal gradient effect has shown that motivation increases as individuals approach their goals (e.g., Kivetz, Urminsky, and Zheng 2006; Nunes and Drèze 2006). However, in this experiment, we did not observe a main effect of goal progress (stage of goal pursuit) on task persistence. Nevertheless, our findings (i.e., the insignificant main effect of goal progress and the significant goal progress x anticipated effort interaction) were in line with a growing body of research showing that the relationship between motivation and goal progress is moderated by a variety of factors (Etkin and Ratner 2012; Fishbach and Dhar 2005; Huang and Zhang 2011, 2013; Zhang et al. 2008).

CHAPTER 9: GENERAL DISCUSSION

We are living in a temptation-rich environment (Hofmann, Baumeister, Förster, and Vohs 2012), and it is estimated that an adult individual spends, on average, 3 hours each day exercising self-control to resist a variety of temptations (Hofmann, Vohs, and Baumeister 2012). Unfortunately, people often fall prey to immediately gratifying temptations and fail to behave in line with their long-term goals (Baumeister and Heatherton 1996; Baumeister et al. 1994). To address this issue, researchers from a range of disciplines have identified a number of self-control strategies aimed at helping people achieve effective self-control. Although these strategies are effective when implemented properly, little research has investigated how individuals initially respond to self-control strategies. In particular, the motivational consequences of the anticipated amount of effort associated with using a strategy remain unexplored.

To address this gap, the present research proposed a theoretical framework suggesting that whether a low- or high-effort self-control strategy is more motivating is contingent on the interplay between anticipated effort and mental focus. Specifically, anticipated effort associated with a self-control strategy has a direct negative (indirect positive) effect on subsequent self-control under a feasibility (desirability) focus. Furthermore, perceived goal importance mediates this effect under a desirability focus, but not under a feasibility focus. Building on cognitive energetics theory (Kruglanski et al. 2012), we reasoned that under a feasibility focus, anticipated effort serves as energy demand and hence contributes to the restraining force opposing goal-directed behavior. In

contrast, under a desirability focus, anticipated effort signals the value or importance of an associated self-control goal and hence contributes to the potential driving force facilitating goal-directed behavior.

We obtained converging evidence for our propositions (see table 3) in a series of six experiments across four common self-control domains (i.e., saving money, maintaining physical health, being persistent, and overcoming procrastination) by employing various self-control strategies, different manipulations of anticipated effort and mental focus, and multiple intentional and behavioral measures of self-control. In experiment 1a, after reading about a behavioral strategy for saving more money, feasibility-focused individuals were motivated to save more money when anticipated effort associated with the strategy was low (vs. high). In contrast, this effect was reversed when individuals were focused on desirability. In experiment 1b, we replicated this effect in a context where a self-control strategy was a product (training shoe). Results showed that feasibility-focused consumers planned to exercise more frequently the following week when anticipated effort was low (vs. high); however, in contrast to our prediction, desirability-focused consumers did not indicate significantly higher planned exercise frequency when anticipated effort was high (vs. low), although means were in the predicted direction. Using a processing fluency technique to indirectly manipulate anticipated effort, experiment 2 demonstrated that greater anticipated effort associated with a persistence-enhancing strategy led to less task persistence when people were feasibility-focused, whereas the effect tended to be reversed when people were desirability-focused (means were in the predicted direction). Using outcome versus process simulation as a proxy for desirability versus feasibility focus, experiment 3

showed that contemplating a low-effort (vs. high-effort) healthy eating strategy enhanced interest in healthy foods and planned exercise frequency among participants who simulated processes and steps of using the strategy, whereas the pattern reversed among participants who simulated outcomes and benefits of using the strategy. Furthermore, results provided initial evidence for the mediating role of perceived goal importance in the desirability focus (outcome simulation) conditions. Experiment 4 manipulated mental focus through construal level. We observed that contemplating a high-effort (vs. low-effort) anti-procrastination strategy under high levels of construal decreased procrastination on a subsequent task, whereas this effect was reversed under low levels of construal. More importantly, we obtained further evidence for the mediating role of perceived goal importance. Finally, in experiment 5, we further extended our findings by showing that relative focus on feasibility versus desirability could be triggered by initial versus advanced stages of goal pursuit. Across these experiments, we demonstrated the predicted interactive effect for both abstract and concrete self-control goals. We also ruled out alternative accounts, including actual strategy use, self-efficacy expectancy, perceived control, and affect, among others.

TABLE 3

SUMMARY OF HYPOTHESIS TESTS

Experiment	H1a	H1b	H2
1a	Supported	Supported	-
1b	Supported	Not supported (p = .28)	-
2	Supported	Not supported (p = .12)	-
3	Supported for food	Supported for food	Supported
	Supported for exercise	Not supported for exercise (p = .12)	Supported
4	Supported	Supported	Supported
5	Supported	Supported	-

Theoretical Implications

The present research makes a series of contributions to the literature on self-control, effort, motivation, and goal. First, the present work forms the first attempt to systematically identify the influence of anticipated effort associated with using self-control strategies on subsequent self-control. Although effort investment is involved in self-control acts, little research has directly examined the impact of anticipated effort on self-control (see Fishbach and Trope 2005; Muraven et al. 2006; Trope and Fishbach 2000 for exceptions). Highlighting the importance of anticipated effort, we posited that the influence of a self-control strategy is not limited to its execution; mere contemplation of the strategy can be sufficient to shape subsequent self-control. The results of six experiments provided converging evidence that the effect of contemplating a low- or high-effort self-control strategy on subsequent self-control relies on whether an individual's desirability or feasibility focus is activated. Our findings suggest that, counterintuitively, simple and effortless self-control strategies may not be universally motivating and can actually impair subsequent motivation to engage in self-control. We demonstrated that under a desirability focus, effortful self-control strategies could be more motivating because greater anticipated effort signals greater value of the associated self-control goal. Notably, although prior research on counteractive self-control has demonstrated that anticipated short-term costs (i.e., one-shot pain and effort) associated with a goal-directed activity (e.g., a medical test) can trigger counteractive control processes that *maintain* people's motivation to undertake the activity (Fishbach and

Trope 2005; Trope and Fishbach 2000), the present research identified situations under which anticipated effort (continuous effort as long as a given strategy is used) can *boost* people's motivation to engage in self-control, which is not restricted to the focal activity per se (i.e., implementing the strategy).

Second, we documented a mediating role of perceived goal importance in the interactive effect between anticipated effort and mental focus on self-control. Our findings support our contention that perceived goal importance mediates the positive effect of anticipated effort on self-control under a desirability focus, but not under a feasibility focus. We also found that this interactive effect cannot be explained by the actual use of a given strategy (i.e., the inherent instrumentality of the strategy). We demonstrated the predicted effect both when a focal self-control context provided no affordance of strategy implementation, and when a focal self-control context provided an opportunity for strategy implementation, the execution of which was controlled for.

Third, adding to a growing body of research suggesting the malleability of effort (Buechel and Janiszewski 2014; Briñol et al. 2006; Kim and Labroo 2011; Labroo and Kim 2009; Nielsen and Escalas 2010; Park and Bae 2014; Tsai and McGill 2011), the current research demonstrates that anticipated effort, traditionally viewed as a feasibility cue, also has implications for desirability. This finding echoes those in prior literature showing that a single piece of information (e.g., product price) can be interpreted in terms of either desirability or feasibility (Kim, Park, and Wyer 2009; Lee and Zhao 2014; Tsai and McGill 2011; Yan and Sengupta 2011). We also contribute to cognitive energetics theory (Kruglanski et al. 2012) by showing that expected effort demand could affect both the driving and the restraining force. Specifically, anticipated effort strengthens the

restraining force (i.e., task demand) when individuals are feasibility focused, whereas anticipated effort fuels the potential driving force by signaling goal importance when individuals are desirability focused.

Moreover, this research also contributes to the existing literature on motivation. Although past research has demonstrated the positive influence of expended effort (e.g., sunk cost) on motivation and the positive impact of anticipated effort on motivation given an initial commitment to a given task, this research is one of the first investigations (see also Olivola and Shafir 2013) to show that, under certain situations, anticipated effort associated with an activity can exert a positive effect on motivation even when people can choose not to engage in the activity.

Finally, we add to the goal literature by demonstrating that the presence of a means (a self-control strategy) does not necessarily motivate corresponding goal pursuit and under some circumstances may ironically undermine goal-consistent behavior.

Practical Implications

The current investigation also has important practical implications for consumers, policy makers, and marketers. Our findings suggest that consumers should be aware that increased access to self-control strategies (effortless ones in particular) could be demotivating. Consumers might ironically become more vulnerable to temptations after learning or contemplating a self-control strategy. To circumvent this pitfall and stay motivated, consumers should match their mental focus with the anticipated level of effort required by a given strategy. This finding is particularly important as simple and

effortless self-control products or tools (e.g., diet pills, weight-loss teas, MyFitnessPal app, etc.) are typically provided to individuals, yet they tend to focus on the desirability of a behavior (Liberman and Trope 1998; Liu 2008; Vallacher and Wegner 1987). Such a mismatch between anticipated effort and mental focus may undermine perceived goal importance and discourage subsequent self-control, exactly the opposite of what is intended.

Despite their good intentions, policy makers and marketers should be cautious when providing simple and effortless self-control strategies or products to consumers in spite of good intentions. In fact, less demanding strategies are not universally beneficial. Instead, policy makers and marketers should target different groups of consumers with different self-control strategies in order to align the effort requirements of the strategies with consumers' chronically salient or incidentally activated mental focus. For example, to best motivate people's goal-directed behavior and achieve long-term success for their product offerings (goal attainment means), marketers such as weight-loss program providers should provide low-effort services to feasibility-focused consumers (e.g., those who are at the initial stage of pursuing of a weight-loss goal), whereas they should provide high-effort services to desirability-focused consumers (e.g., those who are at the advanced stages of pursuing of a weight-loss goal).

Limitations and Future Research

This research is not without limitations. First, we conducted all the experiments on MTurk. Although MTurk workers represent the average North American consumer

better than undergraduate students, it remains to be addressed whether the same effects would arise among different populations. Given weaker experimental control for MTurk studies than for lab studies, we would expect to observe similar effects in the broader population. Second, despite converging evidence for the proposed framework, we acknowledge that the effect was weaker in some experiments (experiments 1b and 2). This may be due to small sample size for MTurk studies and the strength of our manipulations. Third, in the current studies, people were exposed to a single self-control strategy. However, in their daily lives, they may simultaneously encounter information about multiple self-control strategies along with various distractions. Whether anticipated effort affects subsequent motivation to exercise self-control in this environment warrants investigation.

There are also several relevant questions that need to be addressed in future research. First, an implicit assumption underlying the effect of anticipated effort on subsequent self-control is that effort information on a given strategy is perceived as diagnostic. Thus, a potential boundary condition for the proposed effect is that effort no longer implicates energy demand or goal value. In line with this reasoning, prior literature has shown that people will no longer make judgments based on subjective processing effort when it is perceived as nondiagnostic (e.g., Kim and Labroo 2011; Schwarz 2004; Tsai and McGill 2011). Future studies may want to test whether this finding extends to anticipated effort. Second, future work should also explore new situational and individual factors that naturally elicit a feasibility or desirability focus when people are contemplating a self-control strategy. For example, mere downward or upward head and eye movements may be impactful enough to change people's relative focus on feasibility

versus desirability (Van Kerckhove, Geuens, and Vermeir 2015). Third, in the real world, individuals may not encounter a self-control dilemma in the same domain after exposure to a low- or high-effort self-control strategy. Instead, they may subsequently come across self-control conflicts in contexts unrelated to the strategy. An interesting question is whether mental focus and anticipated effort associated with a strategy (e.g., a calorie-control strategy) jointly influence subsequent motivation to exercise self-control in a different self-control domain (e.g., impulse buying). The answer is possibly yes. According to goal shielding theory (Shah, Friedman, and Kruglanski 2002), an activated goal to which individuals are committed inhibits competing alternative goals. Thus, given two competing self-control goals, the interactive effect between anticipated effort associated with a given strategy and mental focus on subsequent self-control might be the reverse when the subsequent self-control conflict involves a goal that conflicts with the goal associated with the strategy. We found empirical support for this postulation in another project. Specifically, we found that, under a feasibility focus, less anticipated effort associated with a strategy for physical health subsequently undermined (rather than enhanced) self-control performance in a different domain (i.e., task persistence). Conversely, under a desirability focus, less anticipated effort subsequently enhanced (rather than undermined) self-control performance.

In addition, apart from anticipated effort demand, future research should also investigate how other features of self-control strategies may affect subsequent goal-directed behavior. Another ongoing project addresses this question by looking at the influence of the perceived effectiveness or instrumentality of a strategy. Across a series of studies, we demonstrated a boomerang effect, such that providing a more effective

self-control strategy to people low in trait self-control (i.e., those who are most in need of help) ironically undermines their motivation to exert self-control, because the presence of a highly effective strategy makes them feel licensed to indulge. In a word, future inquiries into the effects of various characteristics of self-control strategies on subsequent self-control have the potential to bring about many fruitful findings and enhance individual and social welfare.

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Appendix A:

The “Take A Step Back” Strategy (Experiment 1A)

Anticipated Effort: Low

The "Take A Step Back" Strategy

Impulse buying occurs when a consumer experiences a sudden and powerful urge to buy something immediately. Impulse buying can wreck people’s finances and is a major reason why most people have difficulty saving money. **The key to saving money is controlling impulse buying.**

One strategy for avoiding excessive impulse buying is to **"take a step back." When you see something that you want to buy on impulse, literally take a step back (physically) from where you are and silently count to 10 (or 20 or whatever number works for you) before you do anything else.** Then re-assess whether you really want to make the purchase.

This "take a step back" strategy **disrupts** the impulse to buy and **orients** people towards their long-term goals, which in turn helps consumers resist the temptation of buying products they do not really need.

Research indicates that this strategy is **almost effortless**. According to a recent large-scale survey, **83%**of respondents who followed this strategy when shopping reported that **it does not require much effort at all.**

Anticipated Effort: High

The "Take A Step Back" Strategy

Impulse buying occurs when a consumer experiences a sudden and powerful urge to buy something immediately. Impulse buying can wreck people's finances and is a major reason why most people have difficulty saving money. **The key to saving money is controlling impulse buying.**

One strategy for avoiding excessive impulse buying is to **"take a step back." When you see something that you want to buy on impulse, literally take a step back (physically) from where you are and silently count to 10 (or 20 or whatever number works for you) before you do anything else.** Then re-assess whether you really want to make the purchase.

This "take a step back" strategy **disrupts** the impulse to buy and **orients** people towards their long-term goals, which in turn helps consumers resist the temptation of buying products they do not really need.

Research indicates that this strategy is **rather effortful**. According to a recent large-scale survey, **83%** of respondents who followed this strategy when shopping reported **that it requires a substantial amount of effort.**

Appendix B:

NIKE Free Trainer (Experiment 1B)

Anticipated Effort: Low

NIKE FREE TRAINER: THE ULTIMATE TRAINER FOR ANY WORKOUT

Some call the Nike Free Trainer **a magical toning shoe**. It is a training shoe that is designed to help you get fit with **limited practice or effort**. Its Diamond FLX technology allows you to achieve an increase in muscle tone with **less burn** from each squat, lunge, or stride you take. You will **hardly** feel like you are working hard, but you will see amazing effects.

THIS SHOE DOES IT ALL **FOR** YOU.

FREE TRAINER: IT WORKS HARDER SO YOU DON'T HAVE TO!

Anticipated Effort: High

NIKE FREE TRAINER: THE ULTIMATE TRAINER FOR ANY WORKOUT

The Nike Free Trainer is **not a magical toning shoe**. It is a training shoe that is designed to help you get fit when accompanied by **diligent practice and effort**. Its Diamond FLX technology allows you to achieve an increase in muscle tone from each squat, lunge, or stride you take. You will feel **how hard you are working** and see amazing effects.

THIS SHOE DOES IT ALL **WITH** YOU.

FREE TRAINER: IT WORKS AS HARD AS YOU DO!

Appendix C:

The "Muscle-Firming" Strategy (Experiment 2)

Anticipated Effort: Low (Easy-to-Read Font)

Tightening of Muscles Strengthens Willpower

A recent study in the *Journal of Consumer Research* has shown that firming one's muscles (clenching a fist, tightening the calf muscles, or firming one's biceps) while working on an unpleasant task can strengthen willpower and task persistence. For example, study participants were asked to submerge their hands in an ice bucket for as long as they could. Participants who tightened their muscles while doing so kept their hands in the ice bucket much longer than those who did not tighten their muscles.

This research demonstrates how physical actions affect the way we think. Contracting muscles while working on an unpleasant task can mobilize willpower and, consequently, boost persistence on that task.

So the next time you are tempted to give up on an unpleasant task, clench your fist or firm your biceps. Your persistence will firm up, too.

Anticipated Effort: High (Difficult-to-Read Font)

Tightening of Muscles Strengthens Willpower

A recent study in the Journal of Consumer Research has shown that firming one's muscles (clenching a fist, tightening the calf muscles, or firming one's biceps) while working on an unpleasant task can strengthen willpower and task persistence. For example, study participants were asked to submerge their hands in an ice bucket for as long as they could. Participants who tightened their muscles while doing so kept their hands in the ice bucket much longer than those who did not tighten their muscles.

This research demonstrates how physical actions affect the way we think. Contracting muscles while working on an unpleasant task can mobilize willpower and, consequently, boost persistence on that task.

So the next time you are tempted to give up on an unpleasant task, clench your fist or firm your biceps. Your persistence will firm up, too.

Appendix D:

The "Eat Slow" Strategy (Experiment 3)

Anticipated Effort: Low

Slow Down Your Eating Speed For Physical Health

It takes time for your brain to recognize that your stomach is full when having meals. **Eating slowly** allows time for fullness signals (i.e., the feeling of satiety) to register in the brain before you have eaten too much. Thus, it requires less food to fill you up if you eat slowly. It has been shown that a slow eating rate is associated with decreases in calorie intake as well as increases in water consumption. People who eat their meals more slowly also tend to weigh less. According to a recent large-scale survey, **81%** of respondents who followed this strategy reported that **eating slowly does not require much effort,** because they can simply take small bites and chew food thoroughly to slow down their eating speed.

Anticipated Effort: High

Slow Down Your Eating Speed For Physical Health

It takes time for your brain to recognize that your stomach is full when having meals. **Eating slowly** allows time for fullness signals (i.e., the feeling of satiety) to register in the brain before you have eaten too much. Thus, it requires less food to fill you up if you eat slowly. It has been shown that a slow eating rate is associated with decreases in calorie intake as well as increases in water consumption. People who eat their meals more slowly also tend to weigh less. According to a recent large-scale survey, **81%** of respondents who followed this strategy reported that **eating slowly requires a substantial amount of effort,** because, in order to slow down the eating speed, they need to constantly monitor the eating process, ensure that they always take small bites, and chew every bite thoroughly.

Appendix E:

The Manipulation of Mental Simulation (Experiment 3)

Process Simulation

While you are reviewing the behavioral strategy on the following screen, imagine the **PROCESS** that you will go through if you adopt this strategy in the future. As you visualize this in your mind, focus on how you might use this strategy and on the **specific steps** you might take when using the strategy.

Outcome Simulation

While you are reviewing the behavioral strategy on the following screen, imagine the **BENEFITS** that you will gain if you adopt this strategy in the future. As you visualize this in your mind, focus on the reasons why you might use this strategy and on the **specific benefits** that using the strategy might have for you.

Appendix F:

The "Self-Talk" Strategy (Experiment 4)

Anticipated Effort: Low

A simple strategy to help beat procrastination is to practice **"self-talk"**. How people think about things plays a key role in how people feel about them and how people act in relation to them. Therefore, people can **try talking themselves into doing it** ("I'll feel better once it's done" ... "If I start now I won't be so stressed later" ... "If I get this done, I'll be better able to enjoy my time" ... "This topic might be quite interesting" ... "Once I get started, it won't be that bad" ...).

Research indicates that this strategy is **almost effortless**. According to a recent large-scale survey, **81%** of respondents who followed this strategy reported that **it does not require much effort at all.**

Anticipated Effort: High

An involved strategy to help beat procrastination is to practice **"self-talk"**. How people think about things plays a key role in how people feel about them and how people act in relation to them. Therefore, people can **try talking themselves into doing it** ("I'll feel better once it's done" ... "If I start now I won't be so stressed later" ... "If I get this done, I'll be better able to enjoy my time" ... "This topic might be quite interesting" ... "Once I get started, it won't be that bad" ...).

Research indicates that this strategy is **rather effortful**. According to a recent large-scale survey, **81%** of respondents who followed this strategy reported that **it requires a substantial amount of effort.**